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NAVY SHIPBUILDING PROBLEMS AT GENERAL DYNAMICS

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BEFORE THE

SUBCOMMITTEE ON INTERNATIONAL TRADE,
FINANCE, AND SECURITY ECONOMICS

OF THE

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NAVY SHIPBUILDING PROBLEMS AT GENERAL DYNAMICS

MONDAY, APRIL 15, 1985

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON INTERNATIONAL TRADE, FINANCE,
AND SECURITY ECONOMICS OF THE
JOINT ECONOMIC COMMITTEE,
Washington, DC.

The subcommittee met, pursuant to notice, at 10 a.m., in room SD-628, Dirksen Senate Office Building, Hon. William Proxmire (vice chairman of the subcommittee) presiding.

Present: Senators Proxmire and Mattingly.

Also present: Richard F. Kaufman, general counsel.

Senator PROXMIRE. The subcommittee will come to order.

Our witness this morning is Mr. MacDonald.

Mr. MacDonald, would you like to take a position right here?

Thank you, sir, very much.

I have a short statement then we'll be happy to hear your statement and we have some questions for you, sir.

OPENING STATEMENT OF SENATOR PROXMIRE, VICE CHAIRMAN

Senator PROXMIRE. We've been holding this latest series of hearings on Navy shipbuilding at the Electric Boat Division of General Dynamics since last July.

ALLEGATIONS OF WRONGDOING BY GENERAL DYNAMICS

The record so far is loaded down with allegations of wrongdoing and questionable actions by the company in the performance of two contracts for the construction of 18 nuclear-powered submarines.

What is disturbing is the amount of documentary corroboration of the allegations.

In the July hearings, a number of documents were released that tended to support some of the allegations of P. Takis Veliotis, the former head of the Electric Boat Division and a vice president of General Dynamics.

Two weeks ago, a staff study was released showing that there was much additional evidence of wrongdoing by General Dynamics.

The ball is now in General Dynamics' court. A substantial case has been made that the company:

One, bought into the flight II contract by concealing the cost overruns on the flight I contract;

Two, submitted false information to the Navy about man-hours necessary to complete construction of the submarines, while concealing more accurate internal estimates;

Three, submitted false information to the Navy about schedule delays, while concealing more accurate internal estimates;

Four, failed to disclose losses on the submarine contracts in its financial reports to the public and the SEC; and finally,

Five, kept two sets of records on precisely the same elements of its shipbuilding contracts: one—which was grossly inaccurate—for official reports to the Government and public, and the other—the second, which was generally accurate—for internal use.

It seems that General Dynamics deceived the Navy and knew at the time it did so that it was deceiving the Navy.

Gordon MacDonald is executive vice president of General Dynamics for finance and administration, and was general manager of the shipyard in 1976 and 1977.

Mr. MacDonald, we're pleased to have you. We would welcome a statement telling your side of the story responding to any of the allegations that have been made against you and your company. Then we will ask some questions.

Go right ahead, sir.

I beg your pardon, Mr. MacDonald. Mr. MacDonald, will you rise and raise your right hand?

[Witness sworn.]

STATEMENT OF GORDEN E. MacDONALD, EXECUTIVE VICE PRESIDENT FOR FINANCE AND ADMINISTRATION, GENERAL DYNAMICS CORP.

Mr. **MacDonald**. Thank you, Senator Proxmire. You'll have to excuse my voice. I think I lost a little bit of it last night.

Senator **Proxmire**. If you'll wait just a minute, the clerk is going to pull the microphone over so that you'll have access to both microphones. I know it's difficult, but pull the microphones as close as you can and go right ahead.

Mr. **MacDonald**. I am Gorden MacDonald, I am the executive vice president and chief financial officer of the company.

And during the period of May 1976 through October 19, 1977, I was the acting general manager of the Electric Boat Division.

In response to your letter of March 20, 1985, I am appearing before this subcommittee for the specific purpose of discussing the first and second flight contracts of SSN 688 Class submarines built by General Dynamics and allegations of wrongdoing that may have been made concerning cost overrun claims arising out of the performance of those contracts.

In building the 688 submarines, General Dynamics was a "follow" yard. This means that we were building the submarines to a design provided by the Navy through another design agent, in this case, Newport News, which was building the first submarine of this class.

Throughout construction, which was begun before design was complete, the design drawings were late in coming, and often inadequate. The design of the 688 was far more complex and difficult to work with than was anticipated. There were long delays and huge cost overruns. In addition, there were countless change orders that totally disrupted the work in the yard.

We did the best we could under incredibly difficult circumstances. We were supposed to deliver our first boat 10 months after the design agent delivered its first boat. We cut this interval to a little bit over 8 months.

Ultimately, we were compelled to file claims for overruns attributable to design and change problems, and we did so in 1975 and 1976. The second claim, filed on December 1, 1976, lead to the Public Law 85-804 settlement. Because of opposition from Admiral Rickover, it also led later to a lengthy grand jury investigation.

THE CLAIM

In discussing this claim, I should first put things in the proper context. Let me first explain to you my involvement and my position during the processing and submission of the claims.

A claim was filed on December 1, 1976, with the Navy in the amount of approximately $544 million covering changes on the first and second flights of the SSN 688 Submarine Program for Navy responsible events through the period of October 1976.

I am the one who signed and certified that claim. In connection with doing so, I instructed the personnel at Electric Boat responsible for preparing the claim to make certain that it was fair and accurate, and that it did not include invalid elements thrown in for bargaining purposes. Everyone understood this. The extraordinary, meticulous manner in which the claim was prepared has been fully described in the memorandum that General Dynamics submitted to the Justice Department in its grand jury investigation on August 1, 1980.

In certifying that claim, I relied upon the certifications submitted to me by all responsible Electric Boat personnel that the claim had been properly, honestly, and accurately prepared by the professionals in the yard. Given my responsibilities as the acting general manager at the time, I, of course, did not personally participate in preparing any of the details of the claim. I could not then, and I cannot now, respond to detailed questions about the thousands of factual matters covered in that claim.

The filing of this claim in 1976 gave rise to a heated controversy with the Navy as to who was responsible for the loss on the program.

Nonetheless, as I understand it, neither the Navy Claims Settlement Board, or the Office of the Navy General Counsel, the SEC, or the Fraud Section of the Justice Department found any fraud in the claim, or any grounds for a criminal prosecution.

A couple of years after the Justice Department declined prosecution, and independent study of that investigation was done by a separate office within the Criminal Division. This separate and independent Justice Department review rightly concluded that there was no basis for a fraud prosecution for the simple reason that the issue being investigated did not involve the criminal law, but involved legal disputes as to the proper legal conclusions to be drawn from the underlying facts.

Still more recently, Assistant Attorney General Trott, who was not in office at the time of the original investigation, apparently reexamined this matter. Last summer, he informed this committee that there was not "one scintilla of evidence" to justify indicting General Dynamics.

This conclusion was absolutely correct, and it is precisely the position that the company has taken throughout this cruel and unjustifiable ordeal.

Nevertheless, the ordeal has been renewed following accusations by Takis Veliotis, who, as far as I know, has produced no new evidence whatsoever. He was not at Electric Boat when the claims were filed and he knew little if nothing about the claim.

WHY THE CLAIM WAS JUSTIFIED

Now, let me talk about these claims and explain very simply why they're entirely justified and not fraudulent in any respect. The claim really involved two major elements. First, the company contended that it was the Navy that was legally responsible for the entire period of delay between the delivery schedule embodied in the contract and the delivery schedule embodied in the claim. The delay in the program of several years cost the company hundreds of millions of dollars.

The Navy has always conceded that a substantial part of the problem on the 688 program arose from the inability of Newport News, the design agent, to provide necessary data in a timely fashion to enable Electric Boat to build the 688 ships on schedule. This failure was concededly the legal responsibility of the Navy. The argument with respect to the delay portion of our claim was whether the Navy was responsible for all of the delays, or only a part of it, in view of the various internal problems at Electric Boat which have been highlighted in a number of documents referred to in Mr. Kaufman's study of April 2, 1985.

General Dynamics' position that the Navy was legally responsible for the entire period of the delay relied, for the most part, on two simple propositions: No. 1, it was our belief at the time and remains our belief today that we could have delivered the second flight of 688's on time, despite whatever internal problems we had to wrestle with, had the Navy and the design agent not utterly disrupted the program through the failure of the design agent to provide proper and timely data to construct the submarines.

In the claims themselves, we discussed in detail the type of management problems in the yard which Mr. Kaufman's study refers to, and we explained why it was in our view that most of these internal problems were ultimately traceable to the design agent's failure to perform. One could disagree with that conclusion, but the underlying facts were in no way concealed.

No. 2, as we were advised by counsel, the issue of who is responsible for the delay in ship deliveries was really a legal question, and not merely a factual question. We relied on legal authority to the effect that if one of two parties to a dispute is the overwhelming and primary cause of the loss, then that party is legally responsible for the entire loss, notwithstanding the fact that there was some limited fault on the other side as well.

No one can say how the Federal courts would have ultimately resolved these disputes had the case between the company and the

Navy ultimately gone to trial. Mr. Kaufman in his thorough study of April 2 has suggested some arguments the Navy could have made. We, then, have made all the arguments set out in our claim, and we believe we would have won. We believe we might have done considerably better than we did through the Public Law 85-804 settlement. Nonetheless, we agreed with the Navy that it was best for both parties and for the country to resolve this dispute in the way it was resolved. That settlement cost us $359 million and meant that, in effect, as of 1978, the Electric Boat Division had built virtually the entire nuclear submarine fleet for the Navy and many other submarines over a period of 40 years for a profit of zero dollars and zero cents. That was a pretty big blow to take.

In any event, it was entirely proper to argue from the facts known to both parties that the Navy was the principal and overwhelming cause of the delay; and therefore legally responsible for the entire delay, just as it would have been entirely proper, had there been no Public Law 85-804 settlement, to advance the same arguments in court, and wait for the judge to decide which party was right.

This was all laid out very thoroughly in our claims and in our legal submissions to the Justice Department. The Justice Department's independent study in 1983 of the criminal investigation came essentially to the same conclusion.

The only other major element in the claim was quite technical and involved the items of unsuitable submarine design. As far as I know, this issue is not a focus of this inquiry. I can describe it further if you desire, but it, too, involved a purely legal issue as to the legal standard for imputing knowledge to the company as of the time of the 1973 bid on the second 688 contract.

The Justice Department obviously concluded that we were right in our position and no fraud could be involved in our disclosing the facts and advancing a legitimate legal position.

Putting aside details and minor matters, these were the issues in the criminal investigation. I would hope that fair minded persons could by this time understand why Assistant Attorney General Trott, who was not around at the time but who reviewed the situation later, could inform this committee that there was not one scintilla of evidence of any crime committed by General Dynamics with respect to these claims.

PUBLIC LAW 85-804 SETTLEMENT

There was also nothing improper about the 1978 settlement with the Navy or the negotiations that led up to it. I did not know until recently the entire process that the negotiated settlement went through from the Government's side.

Saturday, I happened to be watching Public Television and I saw former Navy Secretary Hidalgo appearing before this committee. His statement indicated that the Navy Department, the Deputy Secretary of Defense, the Secretary of Defense, the General Accounting Office, and the U.S. Congress had reviewed this settlement. Even President Carter was briefed on this settlement.

This level of review should certainly give one complete confidence that the negotiated settlement was proper in all respects. I can assure you that Secretary Hidalgo was a very tough negotiator and fought very, very hard for the Navy. He made us take a terrible beating on that contract.

In briefly reviewing Mr. Kaufman's study, I am not sure that he is really claiming that there was any criminal fraud in these claims. He seems to be concentrating mainly on some other issues, which I would like to address briefly.

THE KAUFMAN STUDY COSTS AND SCHEDULES

In his study, Mr. Kaufman refers to numerous documents previously reviewed by the SEC and/or the Justice Department which concerned various cost estimates, proposed schedules, and financial data generated by various persons within the company over the period of years. He has compared various documents with each other and suggests that these documents show that Electric Boat was withholding vital information from the corporate office, the Navy, the SEC and the shareholders.

This is the origin of the suggestion that Electric Boat was keeping, quote, "two sets of books." Mr. Kaufman's study shows that he and his colleagues devoted a lot of hard work to their project. I do not question their good faith. However, their conclusions are completely erroneous because they are based on fundamental misconceptions as to the nature and significance of documents they reviewed.

First, let me say unequivocably that to the best of my knowledge and belief, General Dynamics has never filed any false financial reports with the SEC or its shareholders.

Next, Electric Boat at no time published a delivery schedule to the Navy that was not an honest schedule that Electric Boat believed it could meet based upon the various assumptions that went into that schedule. Third, Electric Boat never published a cost to complete to the Navy, to its auditors, or to its shareholders that was not an honest cost to complete that Electric Boat believed it could meet based on the various assumptions that necessarily go into a cost to complete.

Finally, to the best of my knowledge and belief, no one at Electric Boat, or in General Dynamics, improperly delayed the disclosure of new cost and schedule estimates so as to deceive the Navy, the shareholders, or anyone else.

In order to understand the misconceptions in the Kaufman study, it is essential to understand what a cost to complete is. It is not a scientific formula, and it cannot be computed with certainty. Quite the contrary. A cost to complete is a prediction. Into that prediction go various ingredients, some more or less objective, some highly subjective.

To derive a cost to complete, you need to study factors such as return cost, predicted schedules, the workload of the yard, the manpower availability, trends in costs, problems that you know about, plans and hopes for productivity improvements, the record of the company's performance on work that we believe analogous, and where it is a follow ship contract as this one was, assumptions as to whether the experience of enormous "change" traffic would continue or slow down as a result of the future performance of the design agent.

Different people working from different perspectives and operating on different assumptions produce a different tentative and predicted cost to complete. It is then the job of senior management to evaluate these inputs and to conclude what cost to complete represents in the best judgment of all circumstances considered.

That is why we had numerous review meetings. The fact that there are memos in the files containing various different estimates does not mean in any way whatever that the company was keeping two sets of books. All the memos prove is that you have various different inputs, tentative conclusions, rejected alternatives, and so forth.

The facts with regard to delivery schedules on the submarines are essentially the same. The delivery schedule is also a prediction. It is interrelated to the cost to complete. It is based on assumptions as to the expected performance of the design agent, plans with regard to the availability and utilization of manpower and facilities, expectations as to hoped-for productivity improvements, similar matters. You can predict a number of different but completely honest delivery schedules on a variety of different assumptions.

Once again, the fact that there are in the files various memorandums and other documents relating to schedules or proposed schedules that are different from those submitted to the Navy does not in any way show that the company was keeping two sets of books. All it shows is legitimate differences of opinion, tentative input, and rejected alternatives.

With respect to both cost to complete and delivery schedules, there is no doubt, in hindsight, that things turned out worse than anyone anticipated. No one fully understood the impact upon the program of the late and unsatisfactory design, and the unbelievable number of changes flowing therefrom.

THE ALLEGED BUY-IN

The Kaufman study also revives the accusation that we bought into the 1973 contract by bidding less than we knew it would cost, presumably, with the intent of filing cost overrun claims later. This accusation was disproved by the Justice Department investigation, and the arguments Mr. Kaufman now makes are based on faulty analysis and ignorance of the fact General Dynamics believed it could make a profit on that bid.

I know because I was there at the time Mr. Lewis approved that bid. The Kaufman study says that the Navy was misled because they did not have the return cost information from us on the submarines already under construction for a period later than the fourth quarter of 1972. This is false.

The Navy received our reports on 1973 first and second quarters return cost in May and October 1973, before the contract was signed.

The Kaufman study states that a March 29, 1973, review book and an internal memo dated April 5, 1973, contained cost information that was withheld. I am advised that this also is incorrect, in that the cost figures in both these documents were very close to those submitted with our actual bid.

Further, in May 1973, I am informed that an immense amount of current cost and schedule information was given to the Navy long before the contract was signed in connection with the Navy's preaward survey.

The Kaufman study also seems to deny that the Navy bargained us down on the basis of even lower man-hours than we estimated. I am advised that the documents plainly show that the Navy did do this prior to the final agreement.

In short, there is no substance whatsoever to what Mr. Kaufman says about a buy-in.

THE FINANCIAL REPORTING

With respect to the allegation that the company misled the SEC and its shareholders by failing to report a loss on the 688 program until the settlement with the Navy was arrived at in June 1978, there is one simple, important fact that the Kaufman study ignores. The information given to the shareholders over the years prior to the settlement gave ample warning of the risks that had been developing on the 688 program. The clear proof of this is the fact that when the company announced that it would take an immediate $359 million loss as a result of the settlement with the Navy, the stock actually went up, not down.

Under the circumstances, it is patent nonsense to say that we have been deceiving the shareholders. This committee does not appear to refer to any new evidence with respect to financial reporting issues. We discussed them fully in the submission we made to the SEC at the time they closed their investigation.

We believed then, and we believe now, there was no false reporting to the shareholders.

THE 1974 DEDUCTION

I would like to comment, additionally, on two specific serious misunderstandings in the committee's study of April 2. It is suggested that the company took a $95 million tax loss in 1974, and paid a tax-free return of capital to its shareholders in 1979, that this shows we knew of loss in the program far earlier than in 1978 and should have been reported to the shareholders at that earlier time.

This is totally false. Again, the company does not maintain two sets of books, but it does report certain matters on its Federal tax returns differently than it does for SEC financial reporting purposes, because the tax laws so provide.

The Kaufman study fails to recognize the difference between reporting for financial purposes and reporting for tax purposes when it discusses the Federal tax treatment of the $95 million tax deduction.

In this regard, the study is correct in indicating that for 1974, General Dynamics did not accrue any profit or loss on its books for the 688 program, but did claim a $95 million deduction in its 1974 Federal income tax return, based on anticipated losses of more than $750 million on the program.

The large tax loss claimed on the return, however, was caused by the fact that the company anticipated revenue from price escalation and equitable relief from the Navy was not definite enough to accrue for tax purposes, even though this revenue was properly accruable under generally accepted accounting principles.

For purposes of negotiations and overall settlement with the IRS in 1976, the company agreed to accrue the price escalation revenue of approximately $512 million in 1974.

THE 1979 RETURN OF CAPITAL

The Kaufman study also erroneously assumes that the company commenced a special study in 1976 for the purpose of determining whether it could pay a tax free cash dividend in 1978 or 1979 because of large financial losses on the submarine contracts when, in fact, that was never the purpose of the study.

The company requested and received permission from the IRS to adopt the completed contract method of accounting commencing with the year 1976. It was a request the company, and many other companies, made because of a change in the Federal tax laws.

That method permitted deferral of contract profits until the year in which the contract is completed, and also permits certain cost to be deducted in the year incurred against other company income.

Because of the deferral of profits and the current deduction of certain costs for tax purposes, the company projected tax losses for 1976 and subsequent years; thus, it was necessary to conduct a special study to determine the company's accumulated earnings and profits through 1975 in order to determine whether or not future tax losses occurring because of the new method might eliminate the accumulated earnings and profits.

When such earnings and profits are exhausted, dividend payments on company stock are considered a return on capital and not taxable as ordinary income to the shareholder. The special study was not conducted in anticipation of large financial losses on the submarine contracts. Those losses were totally irrelevant to the study.

In fact, the completed contract method of accounting precludes the recognition of losses as well as profits until the contract is complete. Thus, the company received no benefit for tax purposes from any anticipated losses for 1976 and subsequent years.

CONCLUSION

In conclusion, I would like to emphasize once again that on matters of cost schedules and financial forecasts, you can and do have many different honest views within a company. It is the job of senior management to sift all of these and come to the best conclusions they can. This is what we did as honestly and as reasonably as we could. The reason the Justice Department and the SEC finding no wrongdoing is there was none.

I thank you for your patience. I will now attempt to respond to any further questions you have as best I can at the present time, after a lapse of a number of years since these events occurred.

Senator PROXMIRE. Thank you very much, Mr. MacDonald. We are delighted to have Senator Mattingly with us, who has joined the panel, and also to join in the questioning, to the extent he would like to do so.

Mr. MacDonald, you have been the chief financial officer for some time of General Dynamics as I understand it. Is that correct?

Mr. MacDonald. That's correct.

Senator Proxmire. You were also for a crucial period, a short but important period, you were the acting manager of the Electric Boat Shipyard, where the submarines were built, so you have very close knowledge of what was going on.

Mr. MacDonald. That's correct.

Senator Proxmire. And I'd like to say it's very useful, it seems to me, for you to respond as you have this morning to the staff study of April 2, because we now have the staff study, we have General Dynamics' response to it. We also have the documents and records on which the staff study was based.

One of the objectives of the subcommittee is to get the facts out so that Congress can judge the truth. You have not given us access to some relevant documents, but we are pleased that you came forward today and we appreciate that very much.

Now I have some questions for you, sir, and I'm sure Senator Mattingly will have some, too.

First, I want to ask about one of the many internal studies of inefficiency and other problems at the Electric Boat Division Shipyard. This document is a commentary on an industrial engineering plan from G.G. Johnson to J.F. Burns, dated June 11, 1976, just about the time you took over management of the shipyard.

Mr. Johnson was head of the industrial engineering standards; Mr. Burns was director of operations and control. The title page says: "General Dynamics, private information."

I'd like you to follow in your copy there as I read from the fourth page. It says:

> Despite the literally hundreds of studies, plans and recommendations by industrial engineering and others, the division continues to conduct business as usual.

You acknowledge there were many studies conducted at the shipyard, and at the corporate level, of inefficiency and mismanagement in 688 class construction.

Mr. MacDonald. I acknowledge there were many studies made, without question, by various people in the division.

Senator Proxmire. The document goes on to say: "Business as usual means costs are out of control."

What does that mean? Costs are out of control.

Mr. MacDonald. I don't know what his intent was.

Senator Proxmire. I am sorry, I left out one important word. "Business as usual means that '688' costs are out of control."

Mr. MacDonald. I couldn't possibly try to interpret what Mr. Johnson intended at the time. I know what the words mean, if they were in fact true.

Senator Proxmire. The words mean that costs were out of control in building the 688, isn't that right?

Mr. MacDonald. In this gentleman's judgment, apparently yes.

Senator Proxmire. Then further down, "Key event schedules continue to slip."

Can you explain that?

Mr. MacDonald. In his judgment, we were missing some key events that we should be making.

Senator Proxmire. And then No. 4, "Special property is still uncontrolled."

What does that mean?

Mr. MacDonald. I am not sure whether he is referring to company property or government property. I don't know.

Senator Proxmire. What does he mean by "still uncontrolled"?

Mr. MacDonald. I don't know what he means.

Senator Proxmire. Not covered by cost accounting?

Mr. MacDonald. Normally, property would be under the control of accounting and facilities people, but all within the same division.

Senator Proxmire. Then a little further, "The division has two separate cost accounting systems." That is a quotation.

How do you explain that conclusion? Does it mean one system was used for reports submitted to the Navy and SEC and another system used for internal reports?

Mr. MacDonald. I don't know what his opinion or judgment was in order to make a statement like you just read, Senator, but during my period of stay up there, to the best of my recollection, I never knew there were two sets of cost accounting records. That would be a ridiculous way to run a company.

Senator Proxmire. Well, that is astonishing. You moved in to be general manager of the shipyard. You have been chief financial officer since then. This is a report. You were brought in by General Dynamics to make a study, and they say, "The division has two separate cost accounting systems."

Mr. MacDonald. I didn't say that.

Senator Proxmire. I didn't say you said it. I said people brought in by General Dynamics to make the study said—and the quotation is right in front of you there—"The division has two separate cost accounting systems."

Mr. MacDonald. I don't understand, Senator. I thought this was written by——

Senator Proxmire. These were your own subordinates. They worked for you.

Mr. MacDonald. Yes, but you are saying I brought these people in to make this study and they came to these conclusions. I did not do that.

Senator Proxmire. I am told they were your subordinates. They worked under you.

Mr. MacDonald. There is no question that these gentlemen worked under me, yes.

Senator Proxmire. They say here, "The division has two separate cost accounting systems."

Mr. MacDonald. In the judgment of this gentleman who wrote the report. That is what he says here, yes.

Senator Proxmire. They quote, "The division has two separate progressing systems."

Doesn't that mean, among other things, that the shipyard reported to the Navy one figure for physical progress in the construction of the ships while another figure, held internally, showed there to have been less physical progress?

Mr. MacDonald. No, to the contrary, I would interpret that to mean that there was a set of rules governing the progressing of the ship and one man had an opinion that was contrary to that. That is the way I would read that. That is Mr. Johnson.

Senator Proxmire. Well, if you are the superior officer, shouldn't you work on a reconciliation to see who is right rather than have two separate reports that contradict each other?

Mr. MacDonald. No question about it, and during that period of time—as you had indicated earlier, I had been there approximately a month at this time—I had all kinds of people that were telling me the place was in all kinds of trouble, and I would sit down and review this with each of the subordinates that worked for me, separately and together—I would bring in these people at different times. I don't know whether I did it with Mr. Johnson or not. I don't recall that—and try to find out who is right and who is wrong. If something was wrong, I tried to correct it. I tried to take the action necessary to correct it.

But in a large corporation there are always people that have their judgments, that are not necessarily proper or correct.

Senator Proxmire. Then the next remark—and I quote: "Shipyard manning is poorly matched with available work."

Does that mean workers with the appropriate skills were not being supplied in a timely way to areas where they were needed?

Mr. MacDonald. That could mean that, yes.

Senator Proxmire. And then a little further, "Material doesn't appear on schedule."

Does that mean materials were not being delivered on time to construction sites?

Mr. MacDonald. Well, at the time we had some material problems. Some of the material shortages that we did experience were very difficult to handle, but this included government-furnished property as well as our own procured items. They were both significant problems to us, yes.

Senator Proxmire. A little further it said and I quote: "Trades work is partial and out of sequence."

What does that mean?

Mr. MacDonald. Working around. If you did not have the material, you would try to work around that particular job so as to accomplish something and not have people standing around.

Senator Proxmire. A little further—I am still reading from the June 11, 1976, document—it says, and I quote, "There are still no valid measures of the capacity of the shipyard, one, to perform work; two, to utilize machines; three, to employ people."

Can you explain that?

Mr. MacDonald. I believe Mr. Johnson has put his opinion down with those words. That was the opinion of Mr. Johnson and not necessarily the opinion of the people that I had to review this kind of a problem with and try to take the corrective action to resolve them.

Senator Proxmire. And then further, "Data processing costs are up, service is down."

What does that mean?

Mr. MacDonald. That may have been the case. On the other hand, I don't recall that at all. We were growing in the shipyard.

We were trying to implement new systems, better systems to get control. Naturally, it is going to cost you a little more. But service being down, I don't recall that at all.

Senator **Proxmire**. The commonsense conclusion would be that you are spending more money and getting less for it.

Mr. **MacDonald**. Well, that is his opinion, Mr. Johnson's.

Senator **Proxmire**. The next remark by Mr. Johnson: "There are major discrepancies in the production plan between key events and feeder details."

What does that mean?

Mr. **MacDonald**. I don't know. It appears to me that he might be searching for more things just to extend the list. I have a tough time on that because Mr. Johnson is one person. We had a department that had nothing to do except schedule the yard in complete detail. Mr. Johnson was not in that particular function. He was in industrial engineering, if I recall.

Senator **Proxmire**. I just have two more. One is, "Work occurs before or in spite of the paper issue date."

Can you explain that?

Mr. **MacDonald**. This, to an extent—not wholly but to an extent—involves the many changes that were continuing to come in to us from Newport News, the design agent, and our having to feed back through the Navy to Newport News to permit us to keep going and not just stop. That was a disaster from the yard's standpoint.

Senator **Proxmire**. After this long list—the division has two separate progressing systems; shipyard manning is poorly matched with available work; material doesn't appear on schedule; trades work is partial and out of sequence; still no valid measures of the capacity of the shipyard to perform work, utilize machines, employ people; data processing costs are up, service is down; major discrepancies in the production plan between key events and feeder details; work occurs before or in spite of the paper issue date—and the last item reads, "et cetera."

Mr. **MacDonald**. That is a big one.

Senator **Proxmire**. That included just about everything you can think of. What did he mean by "et cetera"?

Mr. **MacDonald**. I guess he ran out of time or something.

Senator **Proxmire**. It looks as if in just about every respect—and many that he couldn't list them—there were deficiencies and waste involved here.

Mr. **MacDonald**. Well, Senator, I can't disagree with the fact that he has a list. All I can repeat is this was his judgment and not the judgment of the senior management of that yard.

Senator **Proxmire**. Did you ever speak to Mr. Johnson or Mr. Burns about this report?

Mr. **MacDonald**. Mr. Burns worked directly for me. Mr. Johnson worked for him.

Senator **Proxmire**. Did you speak to them about this report?

Mr. **MacDonald**. I don't recall whether I did or not. I may have.

Senator **Proxmire**. Didn't you promote Mr. Johnson later that year?

Mr. **MacDonald**. I promoted Mr. Burns.

Senator **Proxmire**. Mr. Johnson was promoted, too.

Mr. MacDonald. He may have been.

Senator Proxmire. To director of industrial engineering.

Mr. MacDonald. That may be, yes.

Senator Proxmire. It appears you didn't have a complete lack of faith in his ability.

Mr. MacDonald. No, just because an individual disagrees with what maybe the management of the division feels is not necessarily that he is dumb and ought to be fired.

Senator Proxmire. I am going to yield to Senator Mattingly. Then I have more questions to follow on this particular matter.

Senator Mattingly. I have another hearing I have to go to, but just listening to the questions, you talk about the fellow saying "et cetera." It sounds like somebody has been working for the Federal Government.

Having spent over 20 years at IBM Corp. myself, listening to somebody talking about data processing costs going up and service coming down, I guess that could be said in any time, any place.

I notice about the two accounting systems—I am glad whoever did this study didn't come in and look at the Federal Government.

Let me just ask you something just for my own edification. Then I will go.

But I noticed in the beginning of your testimony you were talking about the design agents and how Newport News was developing and building one submarine and they were sending down the information, so to speak, down to you all. You say in there it was slow in coming, the information, is that correct?

Mr. MacDonald. Yes.

Senator Mattingly. How many firms were involved in the designing or the studies or consultants? Do you have any idea?

Mr. MacDonald. No; I really don't. There are so many pieces to the submarine that Admiral Rickover, without question, held the complete responsibility for the different design people. But the basic submarine was the design responsibility of Newport News.

There were approximately, if I remember right, 35,000-plus changes, all at a time when we were supposed to be in production.

Senator Mattingly. 35,000 changes?

Mr. MacDonald. Yes, sir, some little, some small.

Senator Mattingly. You say there were internal studies going on, but were there external studies also being done by the Government suppliers, et cetera?

Mr. MacDonald. I am sure there were because many discussions that I had with Admiral Rickover and Admiral Bryan at Sea Systems Command—trying to plead with them about the design changes which were just killing the yard. I know they had something like 900 to 1,000 people, Navy representatives, at Electric Boat, and I imagine even today it is up to that level, if not more.

Senator Mattingly. But when you referred to the 35,000 changes, were some of these changes that you needed right away that you weren't getting, that they were slow in coming, et cetera, or what?

Mr. MacDonald. It was not just a matter of slow coming; it was a matter of slow coming and bad design and we would have to feed back through the Navy to get a design corrected. And in the majority—well, no I can't say the majority—in many, many cases there is no question we were correct.

Newport News had never designed a nuclear submarine before.

Senator MATTINGLY. But the Navy would be the one that would have that information for us, right?

Mr. MACDONALD. Yes.

Senator MATTINGLY. Thank you.

Senator PROXMIRE. Thank you, Senator Mattingly.

Now, Mr. MacDonald, the next document is No. 3 in the packet we have distributed. I am turning to another document dated June 22, 1976, soon after the Johnson report.

This handwritten document has your name at the top and was prepared following a meeting between you and your outside auditors. It discusses the proposal by former Deputy Secretary of Defense William Clements to settle the shipbuilding claims with General Dynamics, the Ingalls Division of Litton, and Newport News, referred to as NPN.

It says at the bottom of the first page, and I quote: "Letter from Max Golden to Norm Victor, telling Norm what schedule to use for purposes of the claim. Shades of NPN—two separate schedules, one for the Navy, one for EB."

Tell us who Max Golden and Norm Victor are and what the statement about two separate schedules means.

Mr. MACDONALD. First of all, could I take a minute and just read this? I have never seen it before.

Senator PROXMIRE. Yes, sir, by all means. Go ahead.

[Pause.]

Mr. MACDONALD. First of all, Max Golden was at the time vice president for contracts for the corporation. Norm Victor was the gentleman who had the responsibility for scheduling the yard; in other words, the detailed scheduling of the yard, as well as preparing the schedule that would have been used in a claim.

Senator PROXMIRE. Was Mr. Victor director of planning?

Mr. MACDONALD. Yes.

Senator PROXMIRE. The memo goes on to say, and I quote: "Schedule slippage has major impact on amount of claim and EB has to get number up as high as possible."

Do you acknowledge that it was your intent, once the second claim was filed, to show as much schedule delays as possible in order to support the claim and that you directed that a claim schedule be published showing substantially greater delays than had previously been reported?

Mr. MACDONALD. Absolutely not.

Senator PROXMIRE. You deny that?

Mr. MACDONALD. I am trying to figure out who wrote this and what the purpose was.

Senator PROXMIRE. Isn't it correct that on June 18, 1976, a few days before the memo I just quoted from, you directed Norm Victor to prepare a shipbuilding schedule that would reflect, and I quote: "a more normal shipbuilding effort" than previous schedules submitted to the Navy, and isn't it true that Victor's schedule showed far greater slippages than the Navy was being told about?

Mr. MACDONALD. To the best of my recollection—and I am not sure about that exact date, Senator—but there was a schedule that was being worked to in the yard. That schedule was a difficult schedule, but the Navy was well aware of it that it was being used to attempt to get the yard to perform and not give them a slip and then actually have the slip come to be, come to pass.

I ask Norm Victor to give me a realistic schedule and what made sense. I believe that may have been the timeframe. I am not sure though.

Senator **Proxmire**. In fact, didn't Victor's schedule completed on August 11, 1976, show that ships in flight II would be delayed up to 3 years while the Navy was being told that later ships in the series would be only 12 or 13 months late?

Mr. **MacDonald**. I am not sure about the specific schedules you mentioned, but if I could just go back one second and mention that there were two schedules, as I have said, the one that the yard was working to and the one that Victor came up with, which had stretched way out. And I asked Norm Victor to go back and come up with something that included some specific productivity improvements that we could incorporate into the yard that was somewhere in between the most pessimistic schedule that he had and the schedule that was used in the yard. And I personally discussed this point with Admiral Bryan, I believe, and maybe Admiral Rickover. I am not sure. We were trying to get something realistic.

Senator **Proxmire**. The charts that I have here show the discrepancies in delivery schedules submitted to the Navy and those kept by the company. The first chart shows the discrepancy that existed in 1975, the one on the right.

Incidentally, the red shows the internal figures on delay and the blue shows what the Navy was told and the only basis on which they had to judge.

It showed—the first chart showed the discrepancy that existed in 1975, and the Navy was told there would be delays of between 5 and 11 months on the early ships and virtually no delays on the last three ships. But an internal schedule showed all ships would be delayed more than a year.

Do you acknowledge that David Lewis personally directed the shipyard to understate the delays?

Mr. **MacDonald**. Absolutely not.

Senator **Proxmire**. You deny that?

Mr. **MacDonald**. Yes.

Senator **Proxmire**. The second chart up here on the left shows the discrepancy in 1976. Isn't it correct that Mr. Lewis maintained the policy of understating delays in 1976 and directed you to understate the delays reported to the Navy?

Mr. **MacDonald**. Could you repeat that, please?

Senator **Proxmire**. Isn't it correct that Mr. Lewis maintained the policy of understating delays in 1976 and directed you to understate the delays reported to the Navy.

Mr. **MacDonald**. Absolutely not.

Senator **Proxmire**. You deny that?

Isn't it correct that Mr. Lewis wanted the schedule slippages understated to prevent the price of General Dynamics' stock from slipping?

Mr. **MacDonald**. Absolutely not.

Senator PROXMIRE. Do you acknowledge, in 1977, that you discussed the problems of delays with P. Takis Veliotis and that you expressed to him Mr. Lewis' concern that full disclosure of the delays would cause the price of General Dynamics stock to slide?

Mr. MACDONALD. Senator, I heard a taped conversation between Mr. Veliotis and myself played by the Justice Department. We do not have a copy nor a transcript of that tape. It appeared from the conversation that something had been done to the tape. It did not represent the full conversation. Apparently, that was the case.

Senator PROXMIRE. What was left out? How was the tape doctored?

Mr. MACDONALD. The conversation that I recall on that particular day was the result of a Navy press conference that was held the day before the conversation I had with Veliotis. The Navy press conference stated that General Dynamics was going to overrun the Trident Program by $400 million indicating that we were going to lose that kind of money.

We had conversations with Admiral Bryan, I believe Secretary Hidalgo—I'm not certain—trying to get them to correct the misstatement that had been made and the primary concern was, here we were in a big battle with the Navy on the 688 program and two admirals all of a sudden hold a press conference and say that we're about to lose our shirt on the Trident. And that was ridiculous.

We are not overrunning the Trident contract. As a matter of fact, we made money on the first ship and every ship we built on the Trident Program. We tried to get that corrected. My discussion with Veliotis included primarily the potential loss the admirals claimed on the Trident Program. The schedule was secondary.

We put out a press release as the company that tried to describe this. I was reading to Veliotis what was in the newspaper as a result of the admiral's press conference and our proposed press release. The only thing that's in the tape that I had referred to a minute ago played to me once by the Justice Department, was a schedule problem, and that was insignificant. It didn't mean anything. The big problem was the potential loss and that was all corrected by the Navy in their press release which confirmed ours.

Senator PROXMIRE. Now let's get back to the claim schedule submitted to the Navy on December 1, 1976. Isn't it true that the dilemma you faced was that you needed to show substantial delays to support the claim but if you showed the full extent of the delays, it could affect public confidence in the company and the price of the stock would slide?

Mr. MACDONALD. That's not true.

Senator PROXMIRE. That wasn't the case?

Mr. MACDONALD. No.

Senator PROXMIRE. I want to read the full text of a memo dictated on tape by Mr. Veliotis on December 5, 1977.

Here's the way it goes and I quote:

> December 5, 1977, Monday morning, I spoke with John Rannenberg, I questioned Mr. Rannenberg why they didn't use the Victor schedule on the claims in lieu of the best possible delivery date schedules that they used and Mr. Rannenberg, unqualified, told me that he was directed by Mr. MacDonald and Mr. Lewis. He also said that Mr. MacDonald's concern was the price of the stock. Had we gone in with the Victor claim, the amount of dollars would be much higher and, therefore, MacDon-

ald was afraid that the stock would go down. This is to record my conversation with Mr. Rannenberg.

Do you acknowledge that you had such a conversation with John Rannenberg and that you expressed your concern that if the delays in the Victor schedule were made known, the price of the stock would go down?

Mr. MacDonald. No. In the first place, the movement of our stock up or down is only a problem if someone knows something that ought to be disclosed so that the average shareholder or the people out in the street understand where it is you think you are. We believe that we've done an excellent job of disclosure in General Dynamics, at least since I've been with the company.

As far as Mr. Rannenberg, in the conversation he had with Mr. Veliotis, this is Mr. Veliotis' opinion. Remember, though, he has been indicted for perjury. When did he write this? I have no idea. I wouldn't believe anything Mr. Veliotis would put in print or on tape.

Senator Proxmire. Did you ever hear David Lewis say that he did not want the published schedules to show the full scope of the delays estimated by Victor and others in internal documents because of the potential effects on the price of the stock?

Mr. MacDonald. No, the only thing Mr. Lewis ever said regarding schedules along that line had to do with, if someone comes up with a schedule, you'd better very well make sure that this has been worked out and it's understood and it's the correct schedule because we're going to publish the truth. As far as the comment about the stock, no.

Senator Proxmire. I'm told by Mr. Kaufman, that you didn't answer the previous question I asked, so let me ask it again.

Do you acknowledge that you had such a conversation and I read the memorandum from Veliotis before, with John Rannenberg in which you expressed your concern that if the delays in the Victor schedule were made known, the price of the stock would go down?

Mr. MacDonald. I don't recall a conversation on that at all.

Senator Proxmire. Did you ever have such a conversation with either Rannenberg or Veliotis to your recollection?

Mr. MacDonald. To the best of my recollection, the only time was that one tape that I referred to a minute ago that Veliotis turned over to the Justice Department.

Senator Proxmire. Did you ever have such a conversation with David Lewis?

Mr. MacDonald. No, not to the best of my recollection.

Senator Proxmire. How many shares of stock in General Dynamics did you own in 1976 and 1977 and how much were they worth?

Mr. MacDonald. Senator, I'm going to have to guess; I'm not real sure, but it would be in the neighborhood of probably 25,000 shares and at the time it was probably worth about $2 million.

Senator Proxmire. How many did David Lewis own?

Mr. MacDonald. I don't know. It would probably be better if I got the information for you, if you would like, and submitted it. I'd have to guess on this, too, Senator, because I'm not sure.

Senator Proxmire. Do any of the gentlemen who are with you from General Dynamics have that knowledge?

Mr. **MacDonald**. No, they don't have it with them.

Senator **Proxmire**. Well, the assumption is that he would probably have at least as many as you have.

Mr. **MacDonald**. Oh, he had more than I had, yes. No question.

Senator **Proxmire**. So he had more than $2 million and is it possible that large ownership of stock by top corporate management may have unduly increased the concern about stock prices and making reports on the status of defense contracts?

Mr. **MacDonald**. My honest answer to that is, no. We're certainly not in the stock for the short term; what we'd like it is for the long term and what happens in any particular period of time doesn't mean anything.

Senator **Proxmire**. I understand your position. In many cases, it wouldn't mean that much but in other cases it would, depending on whether you had liquidity problems or whatever.

Let me proceed. On November 28, 1977, Norman Victor sent a memo to P. Takis Veliotis summarizing a new 688 class base line study. In his memo Victor said, and again I quote:

> As part of the study it was determined that earlier ships were overprogressed. For example, SSN 696 launched on a reported 76.5 percent progress. The real progress was determined to be 71.3 percent for that ship at that time.

Doesn't this mean that the Navy was paying you for more progress than had been achieved and the company was, in effect, getting interest-free use of the Government's money?

Mr. **MacDonald**. May I see the memo?

Senator **Proxmire**. This is No. 32 in the package.

[Pause.]

Mr. **MacDonald**. Senator, can you tell me where you were reading from in this particular document, please?

Senator **Proxmire**. The fourth page, about the fifth line—sixth line. Do you see it?

Mr. **MacDonald**. Yes, I do.

It appears to me—I've never seen this document I don't believe. It seems to me like what Victor is doing is telling Mr. Veliotis that he's going to implement a new schedule and that in his judgment he thought he could meet these schedules, talking about undocking for a certain period of time. Talking about how long you keep it in the water.

Senator **Proxmire**. I understand that, but the reason for my question is, because when you overprogressed 76.5 compared to 71.3 may not seem like a great deal but these are very expensive ships; that's a few million dollars. That means that that money gets in before it should; that's a violation of the law, and it means, of course, that General Dynamics was able to earn money on those early payments. The greater the progress payments you can make, the earlier you can get it, it's just plain money in the bank in more ways than one.

Mr. **MacDonald**. There's no question that the way you put it, you are correct. On the other hand, the thing that I'm sure of is there was a procedure in being, approved by the Navy, that was used for progressing ships. I don't know whether what Victor intended, in his words here, to mean but it could mean that if we go to this new system of scheduling, it is overprogressed. He may have meant that; I don't know.

Senator **Proxmire**. According to that Johnson report, there were two sets of progressing; two systems of progressing these ships. This is why we're concerned about it.

Mr. **MacDonald**. I don't recall that other than if it means at one point in time there was a discussion with the supervisor of shipbuilding up there—and I believe this is a requirement—to periodically review the progressing system to make sure that it's still appropriate. Maybe that's what he's talking about.

Senator **Proxmire**. This seems to me to be a confession of wrongdoing. It says, "As part of the study it was determined that earlier ships were overprogressed."

Mr. **MacDonald**. If he's referring to a change in the means of scheduling the yard.

Senator **Proxmire**. This man was the director of planning.

Mr. **MacDonald**. That's correct, he was.

Senator **Proxmire**. He was in a position to speak with authority. He knew what he was talking about. He said they were overprogressed. That means, as I say, it's a violation and it means that the company received Federal funds they shouldn't have received.

Mr. **MacDonald**. If that were the case you would be right. But I'm just saying or suggesting to you I don't believe that was the case unless Mr. Veliotis got him to write something down here to make it look bad for us.

Senator **Proxmire**. Veliotis didn't write that down; Victor did.

Mr. **MacDonald**. But you don't know if Veliotis made him write it down.

Senator **Proxmire**. Victor's still with the corporation; isn't he?

Mr. **MacDonald**. Yes, he is but Veliotis is not.

Senator **Proxmire**. Were you aware that some of the ships were overprogressed during the period when you ran the shipyard? Were you totally oblivious to this?

Mr. **MacDonald**. I was not oblivious, but I will say that to the best of my knowledge, I don't ever recall being told that we were overprogressed.

Senator **Proxmire**. Did you ever have a discussion or any oral or written communication with Norman Victor, David Lewis, or anyone else, about the fact that some of the SSN 688's were overprogressed?

Mr. **MacDonald**. I don't recall any discussion with either party on that.

Senator **Proxmire**. On December 5, 1977, Mr. Victor told Mr. Veliotis in a memo that the then-current delivery schedule could not be achieved.

Mr. **MacDonald**. What date was that please?

Senator **Proxmire**. December 5, 1977. This is in exhibit 33—and that the use of unrealistic recovery schedules—well, I'll wait until you get the memo.

I'm reading from this document that you hold in your hand. It says, "The use of unrealistic recovery schedules, probably adapted to accommodate customer procurement positions with the Congress, caused intermittent crash hiring programs resulting in further inefficiencies from inadequate skill mix." That's on the first page, second paragraph. Will you comment on Victor's analysis?

Mr. **MacDonald**. I've read it, Senator. To a degree I understand what Mr. Victor is telling Mr. Veliotis. I would like to remind the committee that Mr. Veliotis took over the yard in October 1977 at which time he had made many statements including statements to Admiral Bryan and, I believe, Secretary Hidalgo, that he was in the process of preparing a new schedule for both the 668 and Trident and that this schedule—this, by the way, included an estimated cost to complete the 688 program—would not be completed until the end of February 1978. It was completed at approximately the end of February 1978 and it appears to me from this that either Victor is trying to tell Veliotis some thoughts he has, some problems that do exist as far as crash hiring programs—plural——

I don't recall a crash hiring program—plural—during the period I was there. We did have one hiring program of significance but that's certainly not plural; it's singular.

This also talks quite heavily about material problems resulting from late Government furnished design data and Government furnished responsible changes. I don't know, this could be a lot of things.

Senator **Proxmire**. Did you ever discuss with Navy officials the need to withhold from Congress, pessimistic estimates of delivery schedules? Is this something the Navy wanted you to do?

Mr. **MacDonald**. To the best of my knowledge, I don't recall that.

Senator **Proxmire**. That means you don't deny it, right?

Mr. **MacDonald**. I'm trying to think whether I could say absolutely I deny it. I'm not sure; that was about 8 years ago, 9 years ago.

Senator **Proxmire**. I'd like for you to look at a document entitled "Scheduled Comparision Recommended Versus Current." We'll have that available to you right away. It's dated the fourth quarter of 1977. This document shows deliveries for the 688's and the first four Tridents.

My question is, have you ever seen this document or do you recognize it as the kind of schedule comparison prepared at the shipyard?

Mr. **MacDonald**. I can say that I've seen this type of a document many times while I was at the yard. As to whether or not I saw this one, the odds are that I did not but I'm not real sure because I had left the yard at that time. This was strictly related to Mr. Veliotis.

Senator **Proxmire**. Now, the Washington Post story of October 18, 1984—just last year—recounted taped telephone conversations between you and Mr. Veliotis in November 1977, in which you urged that a 1-year delay for the first Trident not be made public to protect the price of the company's stock.

In response to this story, a General Dynamics spokesman said the company had no firm or reliable analysis at the time showing a 1-year slippage. A General Dynamics press release also said that the company used the best data it had at the time from its experts, forecasting delivery in 2 years. But the document I just showed you recommends that the delivery be scheduled for 3 years rather than 2 years.

How do you explain that contradiction?

Mr. MacDonald. In the first place, that goes back to the tape that I told you was played for me once by the Justice Department. We do not have a copy of that tape nor did we have a copy of the transcript of the tape. At that time Mr. Veliotis had no idea what the schedule was and he had indicated, if I remember right also in one of those articles—the tape of which I have not heard—that he'd had conversations with Admiral Bryan where he indicated to Admiral Bryan that, I will not complete my study until—I believe in there, he said—February 1978, at which time I'll tell you, Admiral Bryan, where I am.

That isn't the exact words, but I read that in the newspaper. Whether it's true or not; I don't know.

Senator Proxmire. You see, the question is, you maintained it would be 2 years late, the ship would be 2 years later. The document shows it would be 3 years late. And that's the contradiction.

Now, my question was, how do you explain it?

Mr. MacDonald. I think probably, if I may, Senator, I have a problem with the tape. Before responding, I can try to respond to whatever questions you bring up the best I can, but I would like to state that counsel has advised me to assert the following legal objection with respect to the use being made of these Veliotis tapes.

First, they are totally unauthenticated. We have been given a copy of only one of these tapes. The tape involved is Veliotis with me. We have to examine the tape. We don't have a copy. We don't have a transcript. We believe that it may be incomplete, or even doctored.

We have asked the committee staff of the Dingell committee for copies of the tapes which he had to review and use for the hearing; we have not received any such tape. Counsel advises me that there is a Federal law specifically designed to protect the integrity of judicial and legislative proceedings, and the rights of citizens from unscrupulous persons such as Veliotis, who may surreptitiously record contrived and tailored conversations and attempt to make use of them for criminal torts or injurious purposes.

Accordingly, I must hereby object to the receipt of any and all of Veliotis tapes in evidence or the asking of any questions based upon their alleged contents, on the grounds that they were made in violation of 18 U.S.C. 2511(2)(d), which forbids private parties not serving law enforcement purposes to intercept wire communications for the purpose of committing criminal torts or injurious acts, and title 18, section 2515, which forbids introduction of such tapes or evidence derived therefrom in this legislative proceeding.

However, I wish to make it clear that if the Chair now overrules this objection, I will proceed to answer your questions concerning these illegally made tapes as best I can under the circumstances.

Senator Proxmire. Mr. MacDonald, I'm not talking about a Veliotis tape here. A General Dynamics press release said the company used the best data it had at the time its experts forecasting delivery in 2 years.

This document, which doesn't come from Veliotis, coming from your files; it shows 3 years, that you knew it was 3 years.

Mr. **MacDonald**. I realize, Senator, you are referring to that document, but you also referred to the conversation on tape with Veliotis, and I just wondered if——

Senator **Proxmire**. I think you have answered that part of it. Now the question is about the conflict between the press release of General Dynamics on the one hand, and the scheduled comparison document on the other.

Mr. **MacDonald**. All right, going back to your question on that, because you are setting the tape aside, the press release is the best we had at the time. Veliotis did not have one at the time we made that press release. The Navy had another schedule that I believe was 6 months later than mine, and they believed that to be a reasonable schedule.

I don't know what Veliotis had, Senator, I'm sorry.

Senator **Proxmire**. Is it possible that the Trident schedule submitted to the Navy also did not accurately reflect realistic delivery dates, or that slippages had been understated?

Mr. **MacDonald**. No. As a matter of fact, every schedule that was given to the Navy was the best we had based on my description of it in my opening statement. I had discussions with several of the admirals at times, now I'm including Admiral Rickover and Admiral Bryan in that regard, where I advised them that we were redoing the schedule. We were not hiding anything from them at all. As a matter of fact, that I would personally deliver the schedule to Admiral Bryan.

I think we did a very good job of disclosure with them during the time I was there.

Senator **Proxmire**. Let me ask you a few questions about the bid for the 688 flight II contract in 1973. Didn't General Dynamics know at the time the negotiations of man-hour costs were overrunning on construction of flight I subs? And wasn't this information withheld from the Navy?

Mr. **MacDonald**. No. As a matter of fact, as I said in the opening statement that Mr. Kaufman's study indicated I believe that the Navy was dealing with the fourth quarter 1972 actual information. And that I stated in there that the first quarter in 1973 was delivered to the Navy in May, and the second quarter in 1973 report of actual information was given to them in October, before the contract was finalized.

Senator **Proxmire**. Did those reports show all the cost overruns?

Mr. **MacDonald**. I don't recall what they showed at the time, Senator. I was not at the yard at that time.

Senator **Proxmire**. In fact, they did not show all the cost overruns.

Mr. **MacDonald**. I don't recall what they did show.

Senator **Proxmire**. That's the point, they didn't show it. Didn't the company know as early as 1971 that it was having problems with flight I and that there would be large cost overruns on it?

Mr. **MacDonald**. I couldn't answer that, Senator. I didn't join the company until April 1971.

Senator **Proxmire**. Isn't it true that in 1971, company officials were discussing the need to prepare a claim for cost overruns on flight I? And that cost overruns and delays increased throughout 1972, partly because of what C.B. Haynes, a shipyard executive, described as insufficient planning, and low productivity, and partly due to what Mr. Victor, the director of planning, described as a critical manpower shortage?

Mr. MacDonald. You hit me with 1971 and 1972. I have to discount 1971 completely. As I said, I was just new with the company, and I believe the same thing carried over into part of 1972. I was still trying to learn what was going on in the company. And there were other parts of it that I covered.

Senator Proxmire. Isn't it true that Homer Boyd, a corporate executive, estimated in 1973 that the last of the flight I ships would require 4 million man-hours to build? And the Navy was told at the time of the bid they would require only 3.4 million man-hours?

Mr. MacDonald. I read Mr. Kaufman's study. I looked at the schedule that he included in there of Mr. Boyd's. I have checked with the financial people, which include the cost estimators up at Electric Boat to find out whether Mr. Kaufman's study is accurate in that regard.

The best I could get was an assurance that what we did was used—I'm trying to think of the exact words now so I don't mislead you. I wrote a handwritten note down, I believe. Here it is. I asked the financial people at Electric Boat to check this. And they assure me that the man-hours in the table are not inconsistent with the numbers that we gave the Navy. And if you would like, I could have them put that together with the written explanation, and submit it for the record.

I don't believe I could handle the answer.

Senator Proxmire. You're not denying that the corporate executive estimated 4 million man-hours, one of your people, and the Navy was told it would be 3.4 million?

Mr. MacDonald. I'm not denying that. I'm not admitting it either. I don't know.

Senator Proxmire. In fact, the 11 submarines in flight II required 76.9 million man-hours. Do you deny that corporate and shipyard officials knew during negotiations that the ship would require more than 40.6 million man-hours and David Lewis knew this but ordered a low bid in order to get the contract?

Mr. MacDonald. No, I don't believe we submitted a low bid at all to get the contract because, as I said earlier, we were confident we could have made money on that second flight. And the thing that really was the big problem was that the changes continued at such a high level that we couldn't get the productivity out of that yard that it's currently getting today on both the 688 and the Trident program.

Senator Proxmire. Now, in August 1973, Mr. Victor received a report stating that production problems were still not under control, enumerating many deficiencies in the shipyard and concluding that there would be extensive delivery delays. In November and December of that year, there were more reports of problems and new discussions of the need to file a claim.

Do you acknowledge that productivity did not improve in 1973?

Mr. MacDonald. No, I can't answer that categorically. I know we had problems throughout the whole 688 program. I don't think we comprehended what the problems were, the magnitude of the problems, because we had no control over the design agent. But I think some of these letters that you refer to, there are all types of people, as I said, in a company.

Mr. Victor is a very outspoken man. I take nothing away from his integrity. I think he's a good man in that. But he had one way of getting across his point, and that was to exaggerate an issue.

Again, I'm not saying he exaggerated. I don't know what he meant. I don't believe I can answer the question.

Senator PROXMIRE. He wasn't alone there. Many company internal reports show that conditions got worse in 1974, including a July 10 memo from Mr. Boyd to Max Golden, a corporate vice president, showing shipyard performance had deteriorated, and a statement by Boyd, that, and I quote:

"Performance has gotten progressively worse during the first half of 1974." Unquote.

Arthur Barton, the Electric Boat Division controller, drew similar conclusions in a special study completed in August 1974. Mr. Boyd found that conditions had further eroded in October 1974.

Do you acknowledge that productivity did not improve in 1974?

Mr. MACDONALD. I acknowledged that the problems continued in the yard to whatever degree they had them. Yes.

Senator PROXMIRE. Although there were problems posed by the Navy's designs, didn't Boyd, Barton, Victor, and others in their internal reports attribute much to the shipyard's problems to poor planning, idleness, poor worker attitudes, and other inefficiencies?

Mr. MACDONALD. That's quite a statement. I——

Senator PROXMIRE. That's what the document says. I don't ask you whether you agree. I ask you whether it's not true that Boyd, Barton, and Victor made that attribution.

Mr. MACDONALD. I'm not sure I've seen the document that you have read from. I know there's one here.

Senator PROXMIRE. Isn't it correct that Mr. Barton, in his August 1974 special study, concluded that the man-hour cost to complete forecasts submitted to the Navy were not accurate, inaccurate?

Mr. MACDONALD. You said were not accurate and then you said were not inaccurate.

Senator PROXMIRE. I went a little too fast. Isn't it correct that Mr. Barton, in his August 1974 special study, concluded that?

Mr. MACDONALD. I'm not sure I've seen that document.

Senator PROXMIRE. Are you familiar with the June 4, 1975, letter from Conrad Kunze of Canadair to David Lewis in which Mr. Kunze comments on the results of the study team effort ordered by Mr. Lewis, in which he said he was shocked by the depth of the problems, that they boiled down to ineffective management and unsatisfactory manpower and cost control techniques?

That's exhibit No. 6 in the packet.

Mr. MACDONALD. Senator, if I might just say a couple of things. I know Conrad Kunze very well. As a matter of fact, I served as chairman of Canadair for General Dynamics for many years. I think, probably—if I could just read four paragraphs:

"It is the job of management to identify management's problems"——

Senator PROXMIRE. Can you tell us what you're reading from?

Mr. MACDONALD. This is a note that I made beforehand related to what our problems were. Even the most successful programs, your file should be filled with memos referring to problems you've identified. We had very many problems in the early stages of the 637 class program. That was long before I joined the company. But we turned that program around and wound up delivering the boats early and earning bonuses on them.

We believe we could have turned the 688 program around. I had many discussions with Admiral Rickover on that, on sea trials as well as in his office and in mine.

And I explained in my opening remarks, as we explained in the claims themselves, it appeared to us that many of the internal management problems such as green labor, undermanning, lack of material, and so forth, were ultimately traceable back to the late and inadequate design. Our performance was dependent upon the performance of the design agent who built the 688 submarine, the first.

When you enter into a submarine contract, you do not bid on the theory that your performance will be literally perfect. You will always anticipate having problems and you estimate your delivery schedule with this in mind.

We never said that we didn't make any mistakes and we don't deny that we have made mistakes that did contribute to the delay. We said that had it not been for the impact of the late and inadequate design, we would have delivered the boats on time. We relied on that legal authority that says that if one of the two parties is the principal and overwhelming cause of the loss, they are legally responsible.

But that doesn't mean that we don't deny that we had problems. We have acknowledged this before. Admiral Rickover is well familiar with our admission of that, too.

Senator PROXMIRE. By the summer of 1975, the problems in the shipyards had gotten so bad, the board of directors directed you to visit the shipyard and find out what was wrong.

Isn't that correct?

Mr. MACDONALD. It was a little bit different than that. They were concerned about the reports of the potential problem with changes continuing the way they were. That was the primary emphasis in the reporting to the board—not the only one. I don't mean that. I was asked, and I believe it was on July 3, 1975, to take over both marine divisions and report to the board in our various board meetings how we were doing on the LNG tankers at Quincy, because we had not delivered our first one yet. And that the magnitude of the change problem really was at Electric Boat.

That was the assignment I was given.

Senator PROXMIRE. Didn't you also report after a stay at the shipyard that there was lack of coordination between various groups of planners and management of the yard driving up hours, overtime, and cost. When you reported this, didn't the board want to fire the head of the Electric Boat Division?

Mr. MACDONALD. No, as a matter of fact the board did not, to the best of my recollection, say to fire him. They had sent me up there to supervise the two yards and report back to the board with my recommendation of what ought to be done.

Senator PROXMIRE. You and Mr. Barton met with your outside auditors, Arthur Anderson & Co., on July 30, 1976. You were told by them that the submarine construction program picture had worsened a good deal since the previous December, and they advised you to tell the board of directors about their deep concern; do you recall that?

Mr. MacDonald. I don't recall it because I've never had anyone tell me to tell the board something. I was always the first one to tell them.

Senator Proxmire. The Arthur Anderson memo says this. They said they told you that the construction program had worsened a good deal and they advised you to tell the board of directors about their deep concern.

Mr. MacDonald. They may have said that.

Senator Proxmire. An Arthur Anderson memo dated September 24, 1976, observes that productivity improvements have not been achieved and that recent management changes at the shipyard when you replaced the former general manager were the result of poor performance. Do those observations surprise you or do you disagree with them?

Mr. MacDonald. No, they don't surprise me because it goes back to the continued confusion that existed as a result, primarily, to the continuation of the high level of changes and the confusion in the yard.

Senator Proxmire. You had no prior experience managing a shipyard. Isn't it true that you were given that job primarily to make sure that the very large claim was prepared for submission to the Navy, or otherwise persuade the Navy to pay for the shipyard's cost overruns?

Mr. MacDonald. Absolutely not.

Senator Proxmire. Why were you put in charge in view of the fact that you had no experience managing a shipyard?

Mr. MacDonald. My conclusion, and recommendation to the board was that Mr. Pierce was physically and mentally exhausted and that I felt he had to be replaced. I was put over the yard in May 1976 with the direct agreement with Admiral Rickover that we would find a man to run the yard because I had no experience in building submarines or ships. This was a temporary deal. That's why I was acting general manager. We pursued that, searching for a replacement for many months.

Senator Proxmire. You say this man was replaced because he was physically and mentally exhausted. What does that say about the management of the yard?

Mr. MacDonald. We had a few people that were probably in a similar boat, but they were not of the age that Mr. Pierce was.

Senator Proxmire. In January 1977, David Lewis visited the shipyard and found that conditions had gotten worse. In a memo he sent to you, he described his "very revealing and extremely painful visit." Among other things he said, and I quote, "There are hundreds and hundreds of people who are operating completely without supervision." And the total output on the 688 contracts had not increased even though the number of people assigned to many of the ships has been increased by 100 percent or more.

Do you disagree with Mr. Lewis' conclusion?

Mr. MacDonald. May I see that, please? I have a purpose in that, Senator.

[Pause.]

Senator **Proxmire**. Let me give you that a little later. I'll go on with questioning and come back to that as soon as the staff can find it.

On July 27, Mr. Barton sent you a report, and I quote, "There has been a steady deterioration in our performance since this time last year." He went on to say that man-hour cost overruns for the year were 65 percent for flight I, 24 percent for flight II, and 79 percent for Trident. Do you disagree with Mr. Barton's conclusions?

Mr. **MacDonald**. I'm not familiar with the letter; I'm sorry, Senator.

Senator **Proxmire**. Isn't it fair to say throughout this period that the hoped-for improvements in productivity did not occur, that there were continuing problems of low productivity and high inefficiency?

Mr. **MacDonald**. You said in July; you didn't say what year.

Senator **Proxmire**. This was July 27, 1976—July 1976.

Mr. **MacDonald**. I'd been there since May 1976. And he's talking about performance since a year earlier?

Senator **Proxmire**. Throughout the period, including the time you were there and just before you were there. I presume when you came in you made an analysis of the situation and then you, of course, were on the spot during part of the time.

Mr. **MacDonald**. I don't deny that the productivity was not what we hoped it would be, especially during the period that I was there.

Senator **Proxmire**. When Mr. Veliotis took over from you in October 1977, you received reports of further deterioration. On the day he became general manager he fired 3,000 people. By the end of the year he'd created 2,000 additional vacancies. Don't those actions demonstrate that the shipyard had an excess of manpower and was very inefficient?

Mr. **MacDonald**. No, as a matter of fact, if I might just take the point of the firing of 3,000 people, I have stated in my judgment that he did not discharge 3,000 people and 2,000 more later by the end of the year. But rather there were several things coming to a conclusion, one of them, we were delivering, I believe, the Skipjack with an 800-manpower level. The minute that was delivered there were 800 people that were not needed. He moved the better people over and unfortunately the younger ones had to take over.

Then completed another job for the Navy—I can't remember the name of the specific plant, but it was in Beaver Falls, PA. We were doing overhaul on a Navy reactor plant and we completed that project right at the time I left the yard. And if I'm not mistaken, there were 400 people on that and we reduced about the same time the manpower level of the Trident—I am trying to remember what we called it—up in Albany, NY, significantly and I think these large numbers of people let go were primarily Mr. Veliotis' means of blowing up more problems than really existed.

I'm not denying that there were problems. I'm not denying we didn't make the progress we should have made.

I will acknowledge in your first comment, too, that just prior to my leaving the yard I was advised, I believe, by Mr. Victor that we had had a 10-week slip in a schedule. I may be wrong in the number but it's something like that; 10 weeks on a 2- or 3-year period is not something that's not insurmountable. Norm Victor would be the first to admit that.

They can be overcome but, yes, there was a 10-week slip about the time I left the yard from the prior schedules given to the Navy for, I believe, July 1976.

Senator PROXMIRE. Thank you, Mr. MacDonald.

I want to go back, now, to that question I had on David Lewis. I'll repeat the question. The document's been handed to you. You have it in hand now, so I'll repeat the question.

In January 1977, David Lewis, the top man at General Dynamics, visited this shipyard, found out that conditions had gotten worse and in a memo he sent to you what he described as "was very revealing and extremely painful visit." Among other things, he said that, "there are hundreds and hundreds of people who are operating completely without supervision." That's a quotation. And the total output on the 688 contract has not increased at all even though the number of people assigned to many of the ships had been increased by 100 percent or more.

My question was, Did you disagree with Mr. Lewis' conclusions?

Mr. MACDONALD. The first time I saw this letter was maybe 9, 10 months ago. The letter was never signed nor sent. Why it was not signed or sent, I don't know; I can't answer it. I don't deny that——

Senator PROXMIRE. It was addressed to you.

Mr. MACDONALD. It was never mailed, never sent, never signed. I will not deny some of these points that are in here.

Senator PROXMIRE. Before that, let me ask you, did you know whether or not Mr. Lewis actually dictated the letter, whether it was his letter, or whether it was something that somebody wrote and he had no knowledge of?

Mr. MACDONALD. I assume he wrote it. Mr. Lewis normally writes his own memos. But it was never signed or sent.

Senator PROXMIRE. Did you talk to him about this?

Mr. MACDONALD. No; as a matter of fact, about the letter and everything in it, no. But going back at times, I talked to Mr. Lewis probably once or twice a day on the telephone, in the whole year and a half period I was up there, and I am sure some of these points did come up, no question about it.

Senator PROXMIRE. How do you know the letter wasn't sent and you didn't receive it?

Mr. MACDONALD. I asked him. When I was shown this letter.

Senator PROXMIRE. And he said he'd never sent it?

Mr. MACDONALD. He said he'd never signed it. It was just a draft. Things—I assume he wanted to talk to me about them.

Senator PROXMIRE. Did you talk to him about the letter?

Mr. MACDONALD. No, I did not. I was out of the yard at that time so there was no need for it.

Senator PROXMIRE. How did he tell you he didn't send it then?

Mr. MACDONALD. When I was shown the letter, I asked if this letter was ever sent because I don't ever remember seeing it.

Senator PROXMIRE. Who did you ask?

Mr. MACDONALD. Our inside general counsel.

Senator **Proxmire**. You didn't talk to Lewis about that. Over the years, the forecast of the man-hours needed to complete the ships steadily escalated as reflected in the quarterly reports you submitted to the Navy, the company also had internal reports showing much more man-hours would be required. The charts showed the discrepancy and also the same pattern that existed every year for both contracts.

How do you explain that?

Mr. **MacDonald**. Where are you now?

Senator **Proxmire**. It's on this chart here. It was in the staff study. We had it a couple of weeks ago. As you can see, the forecast of the man-hours needed to complete the ships steadily escalated; that's the blue line. The company also had internal reports showing much more man-hours would be required; that's in the red line. That shows the discrepancy. How do you explain that discrepancy?

Mr. **MacDonald**. You say, the blue is what we told the Navy and the orange is what the internal reports said?

Senator **Proxmire**. That's correct.

Mr. **MacDonald**. The only thing I can say, Senator, I'm not familiar with them. Although I did watch the hearings a short time ago when Mr. Kaufman presented his study. The only thing I could conclude is that the orange line represented some of these stray opinions of people in the yard where, in their judgment, the orange line is where we ought to be. But the opinion of the senior management of Electric Boat said the blue line is it. We have ways of getting there and that's what we went forward with to the Navy.

Senator **Proxmire**. Now, November 4, 1975, Mr. Barton wrote to Joseph Pierce, then head of the Electric Boat Division, that the man-hour cost to a complete system is supposed to be a communications device, but, and I quote: "It is really communicating false information and top management is fostering this."

In view of the fact that the internal estimates were consistently closer to the truth than what was being reported to the Navy, wasn't Mr. Barton right?

Mr. **MacDonald**. Well, I think—I don't know exactly what Mr. Barton meant at the time he wrote that note to Mr. Pierce if, in fact, he did. I don't question that he did.

I think the one part that might be left out is what the impact of all these changes and the problems with Newport News also have to be on there. Certainly, if it's not 100 percent, it's a major part of it.

Senator **Proxmire**. Did you ever discuss man-hour estimates with David Lewis and did he ever direct you or any other official to submit figures to the Navy that were lower than the internal estimates?

Mr. **MacDonald**. I discussed the estimates with Mr. Lewis many times and I don't recall ever being told to do something different as far as submission to the Navy.

Senator **Proxmire**. You don't recall. Do you deny it?

Mr. **MacDonald**. I believe, to the best of my ability, I would deny it.

Senator **Proxmire**. Did Mr. Lewis ever indicate to you or anyone else that the full extent of the manpower estimates be withheld from the Navy?

Mr. **MacDonald**. No; that I don't recall.

Senator **Proxmire**. Mr. Lewis did not direct——

Mr. **MacDonald**. No.

Senator **Proxmire**. Isn't it correct, that withholding the truth about the man-hour cost overruns would have been consistent with the corporate strategy of not damaging public confidence in the company and causing stock prices to go down?

Mr. **MacDonald**. Absolutely not.

Senator **Proxmire**. Would it be consistent with it? It may have not been done. Is it your testimony that the fact that the internal delivery schedules turned out to be more accurate than those submitted to the Navy and the internal man-hour estimates turned out to be more accurate than those submitted to the Navy was a mere coincidence?

Mr. **MacDonald**. No; as a matter of fact, I believe you have to go back to the opening statement that I made. I tried to describe all the ingredients that go into making up an estimate to complete or a delivery schedule and you have to take all of the inputs, sort them out, and decide what is the most realistic thing and probable thing that will happen. That becomes your schedule.

It's very easy to sit back and be the critic and it's very difficult using hindsight, but, you have to be more familiar, I think, with the way these delivery schedules are put together.

Senator **Proxmire**. Now, a memorandum of a conversation with you on September 8, 1975, by a vice president of Chase Manhattan, one of your company's banks, states that you assured him that the company has huge, hidden reserves on its books from a number of other company programs, including the F-111.

Can you explain how General Dynamics hides huge reserves on its books and whether this practice is legal?

Mr. **MacDonald**. Could I see that memo?

Senator **Proxmire**. Yes.

[Pause.]

Mr. **MacDonald**. Senator, could I just glance through this because I am not familiar with this, although the gentleman that apparently wrote it, I assume his initials show me that I know him quite well. I can't believe what I am reading.

Senator **Proxmire**. You say you know Mr. Calwell quite well?

Mr. **MacDonald**. Yes, I do.

Back to your one question, I'd like to answer that if I may, where it says here Gorden also assured us that the company also still has huge hidden reserves on its books or that it can take—which arise from a number of other company programs, including the F-111. I don't ever recall having made a statement like that.

The kind of a statement I've always made to our banks is that we are conservative in how we do our accounting; we disclose really ahead of what the normal practice might be.

When he identified this F-111 Program here, we were in the process of negotiating a major change. I may have mentioned that, but it certainly wouldn't have been a hidden reserve. We don't have hidden reserves.

Senator **Proxmire**. So you deny that you made the statement. The statement is very unequivocal.

Mr. **MacDonald**. Yes.

Senator PROXMIRE. A flat statement also assured us that the company still has huge hidden reserves on its books or that it can take which arise from a number of other company programs, including the F-111. Gorden did have with him substantial amounts of documentation on both the Electric Boat and Quincy Division figures. These are going to be sent to banks and so forth?

Mr. MACDONALD. There's no question we had documents. We gave banks reports every quarter, we had bank meetings every quarter, we very candidly laid out where we thought we were. I don't ever remember making that comment. I would deny that I made a comment about hidden reserves.

Senator PROXMIRE. It would be surprising if the vice president of Chase Manhattan, a man you say you know, would make the statement that you assured him the company has huge hidden reserves on its books.

Mr. MACDONALD. I deny that I used those terms. I would never refer to hidden reserves. We don't have any such thing.

Senator PROXMIRE. You left the Hughes Corp. to become General Dynamics' vice president for finance in 1971.

Mr. MACDONALD. Yes.

Senator PROXMIRE. General Dynamics, we are told, and I'd like you to affirm or deny this, has paid no Federal income taxes since 1972.

Were you hired in part to show the company how to avoid the payment of income taxes? And did you discuss this part of your duties with David Lewis and Henry Crown?

Mr. MACDONALD. No; there was never any discussion of that in that regard. As a matter of fact, Senator, remember, the new tax law that did go into effect in the 1971, 1972, 1973, 1974, and 1975 time period. There was a percentage-of-completion method used for tax purposes which immediately went in in 1976, as I said in my opening statement, with the completed contract method of accounting. We did have tax laws carried forward and back.

We have not paid any taxes since 1972, but it's all within the tax law that the Congress passed. We are looking forward to—I believe it's 1986 will be taxable. I believe that's the date. And, remember, as I said, on the long-term contracts, you take no loss or no profit until you complete the contract.

Senator PROXMIRE. Isn't it true that, during this period, General Dynamics enjoyed a substantial net profit from 1972 through 1984, the period during which you paid no taxes?

Mr. MACDONALD. For financial reporting purposes, that's correct. For tax purposes, the answer is no. And when the Congress passes a tax law, for a company to ignore it, we wouldn't last very long with the stockholders. You do what the law says, and that's what we feel we've done.

Senator PROXMIRE. I don't deny that it's legal. I think it's obvious that General Dynamics made a good move in selecting, from a standpoint of the profit sheet, a man with your acumen and your ability. You made money during that period; hundreds of millions of dollars net, I understand, and you paid no income taxes legally, legally.

You're the financial officer, the brains behind it.

Well, Mr. MacDonald, I appreciate your appearance today. You have stated your position and the company's position on many issues. You've denied virtually all the allegations that have been made. Of course, you are entitled to deny everything, but the denials just don't wash.

It seems to me, in light of the documented facts, you have denied criticism by Electric Boat officials by asserting the officials were exaggerating. You have denied there were two sets of records in the face of clear evidence that the Navy was given one series of estimates while the company had another series.

You deny that you made certain statements to your own leading bank. Obviously, there's a great more to learn about the way General Dynamics performs its Navy contracts.

I want to thank you for appearing. You have been responsive. You have said a number of times you don't recall, but it has been a long time, 10 years or so, and there are complicated matters involved.

Finally, I want to commend you. You are obviously a very competent financial officer. General Dynamics has done quite well by you, the stockholders. The taxpayers haven't done quite as well.

Thank you very much, sir.

The subcommittee will stand adjourned.

[Whereupon, at 12 noon, the subcommittee adjourned, subject to the call of the Chair.]

APPENDIX

DOCUMENTS RELATING TO NAVY SHIPBUILDING AT GENERAL DYNAMICS: THE SSN 688 CLASS SUBMARINE PROGRAM, FLIGHTS I AND II

SUBCOMMITTEE ON INTERNATIONAL TRADE,
FINANCE, AND SECURITY ECONOMICS

Of The

JOINT ECONOMIC COMMITTEE

April 15, 1985

GENERAL DYNAMICS
PRIVATE INFORMATION

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GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO Mr. E. Holt

Date October 27, 1971

FROM J. W. Rannenberg

FILE NO

SUBJECT 688 Program - Delinquent Performance by Design Agent

REFERENCE

1. In a meeting with your office and Program Administration on October 26, 1971, the performance of Newport News as design agent was discussed. and the following shortcomings on their part and other facts were identified:

a. Because of insufficient data from Newport News, there are 56 EB purchase orders which are delinquent to the EB Master Construction Schedule. These include 50 items which are major component problems and HY-80 castings in particular.

b. The EB Master Construction Schedule for 688 at the present time includes a 3-months acceleration of the deliveries to accommodate the shipyard to what are understood to be the Navy's requirements for the follow-on ships, and to accommodate to the availability of shipyard trades.

c. At this point in time it has not been established that from the EB schedule standpoint the difficulty is irrecoverable nor is it established that an excess cost would result. It is apparent, however, that if the situation continues, a point will be reached where the schedule and cost will be affected.

d. The point in time when the problem will have become an ascertained schedule and/or cost problem will be that point in time where the Newport News performance has degenerated to the extent that Newport News cannot recover its own design schedule. That point has not yet been reached, or defined; however, present indications are that they will slip farther.

2. There is a serious difficulty in making a claim for delinquent design agent data under this contract because of Article 16 (i), which contains a disclaimer that reads in part as follows: "The Government does not make any

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Electric Boat Division

MEMORANDUM

[illegible]

TO

FROM

FILE NO

SUBJECT 688 Program - Delinquent Performance by Design Agent - Page 2

REFERENCE

Date

representations or warranties with respect to the timeliness of the preparation and availability of such drawings and data ... and the Government shall not be liable under this contract, or otherwise, on account of such drawings and data." The disclaimer clearly applies to drawings and data other than the ND drawings, and the Government can be expected to assert that it also applies in ND situations. It has been and is our position that there are circumstances where the performance on the part of the design agent can lead to a successful claim for delay costs, notwithstanding the disclaimer. However, it is believed that such a claim can succeed only where the facts are clearly identified and documented and the deficiencies on the part of the design agent are so gross that they are tantamount, as a practical matter, to a failure to supply the data at all. It is clear that the facts as they exist at this time on the 688 could not support a successful claim at this time, for two reasons:

a. It has not been established that Newport News cannot recover from their deficiencies in time satisfactorily to support the EB schedule, and

b. Delay and/or acceleration costs attributable to the Newport News delinquencies have not yet been incurred, and it is not possible to ascertain at this time what those costs may become.

3. One of the so-called anti-claim clauses, Clause 76 of the General Provisions entitled "Problem Identification Reports", is relevant to the present situation. This clause states in part:

"Whenever the Contractor knows of or reasonably can anticipate the occurrence of any 'contract problem,' which term as used herein means a fact or circumstance which can or will significantly or substantially alter the time of delivery or completion of performance

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MEMORANDUM

TO

FROM

FILE NO

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SUBJECT 688 Program - Delinquent Performance by Design Agent - Page 3

REFERENCE

> or can give rise to a substantial claim for increased compensation or for modification of a contract or specification requirements, but excluding any claim for which notice is required by the clause of this contract entitled 'Changes,' the Contractor shall promptly transmit to the Supervisor a 'Problem Identification Report.' The parties agree that the meaning of such words as 'significantly,' 'substantially,' 'substantial' and the like as used in this paragraph shall be interpreted in the same manner as they would be interpreted by a reasonably prudent businessman under all the relevant circumstances ... Notwithstanding the 'Changes' clause of this contract, except for possible claims based upon defective specifications, the Contractor shall not be entitled, because of the occurrence of a contract problem, to any equitable adjustment of the contract price due to the incurrence of costs therefor more than 20 days before the Contractor submits the required Problem Identification Report. Further, required Government actions performed prior to the date of a Problem Identification Report identifying such required Government actions shall be deemed to have been timely performed."

Although for the reasons stated in paragraph 2 above a claim cannot properly be asserted at this time, a "problem" has certainly been identified and can properly be reported to the Government even though the consequences cannot be identified at this time. Although the 20-day limitation is not really a difficulty to us at this time, because we are not incurring delay costs yet which would be cut off by the 20 day rule, since the delinquency is a continuing and progressive problem, it is desirable to submit the report now to preclude the Government from later taking the position that the present Newport News lead yard service is "deemed to have been timely performed."

GENERAL DYNAMICS
PRIVATE INFORMATION

GENERAL DYNAMICS
PRIVATE INFORMATION

GENERAL DYNAMICS MEMORANDUM
Electric Boat Division

[illegible]

TO

FROM

FILE NO.

SUBJECT 688 Program - Delinquent Performance by Design Agent - Page 4

REFERENCE

4. Assuming that a Problem Identification Report will be submitted now, the question can be asked as to when we would be in a position to assert a claim. That point will have been reached when all of the following have happened:

a. It has become an established fact that Newport News cannot recover from their delinquencies in time to support a reasonable EB schedule, and

b. It has been established that as a result, EB will inevitably incur excess costs due to delays and/or acceleration, and

c. The amount of the resulting EB cost can be well supported, and

d. The design agent performance can be demonstrated to be so grossly delinquent as to overcome the disclaimer clause, to the extent that clause applies.

cc: A. M. Barton
Z. J. Noga
S. B. Hellier
G. W. Roos

GENERAL DYNAMICS

Mike

SW
3/8/71

②

File: 688-89-EH March 4, 1971

Subject: SSN688 Construction Contract Cost Reports,
Contract N00024-71-C-0268

Enclosure:
(1) Contract Status Report
(2) Cost-to-Complete Tab Run for the SSN679 Construction
(3) Material Status Reporting

Commander, Naval Ship Systems Command
Department of the Navy
Washington, D. C. 20360

Attention: CAPTAIN C. E. Slonim, USN

via: Supervisor of Shipbuilding
Conversion and Repair, USN
Groton, Connecticut 06340

Sir:

1. The subject contract requires that within six weeks of award, Electric Boat Division furnish to the NAVSHIPS Project Manager, for approval, its proposed cost reporting system. The format shall provide for cost category reporting in accordance with the work breakdown structure as submitted with the Contractor's pricing proposal for this contract. The June 1970 proposal submitted a work breakdown structure that dealt only with the shipyard (operations) trade labor hours. All other labor (non-operations) hours were in general priced by department on a functional basis. Material costs proposed in June 1970 were in the Government Accounting System format. The November 1970 proposal used the June 1970 proposal and accompanying DD-633 documentation as the base which was adjusted for changes in schedule and cost charging pattern, and improved scope information. This adjustment was on an overall basis and not at the original June work breakdown structure level for the operations labor hours.

2. Reviewing Article 10 of the contract in this context, the Contractor has evaluated the various cost reporting and management tools available at Electric Boat Division, which would satisfy the requirements for cost reporting and provide NAVSHIPS with the best assessment of the program status both current and projected. The Contractor has concluded that the formal Budget Ledger and Cost-to-Complete (CTC) estimate made within the Division, which are also primary management tools used by the Division to evaluate the status of the program, would accomplish both purposes. The reports will include direct material dollars incurred and committed.

File: 689-89-EH
Commander, Naval Ship Systems Command
Page Two

March 4, 1971

3. This method of cost reporting will provide the NAVSHIPS Program Office with a system that has the following attributes:

a. The Cost-to-Complete is prepared at the grass roots level by those departments which have an input to the SSN688 class program, and therefore the familiarity of what is required to accomplish the work scope.

b. Review of the Cost-to-Complete at high Electric Boat Division levels by the listed functions will filter out erroneous conclusions:

(1) Staff manager responsible for the performance of the departments.

(2) Comptroller departments.

(3) SSN688 Class Program Office.

4. Attached herewith are the following:

a. A contract status report which shows a comparison between the budget as adjusted by changes and estimated cost at completion.

b. A copy of the Cost-to-Complete tab run for the SSN679 construction which shows the typical data involved and the format for such data.

c. A copy of the material status reporting.

5. You will note that these reports contain expenditures to date, both labor and material, by department, a time phased estimate of the cost-to-complete the remaining work, and the estimate at completion. The basic data is in direct labor hours and material dollars. Item (a) above takes this information and applies the estimated direct labor and overhead rates to obtain the total cost at completion. It also includes the percent of physical progress completed as confirmed with Supervisor of Shipbuilding, Groton. This data enables Electric Boat Division to establish its budgets for completion of the work, its man loading requirements by trade for the work yet to be completed and how much it is estimated the job will cost when it is in fact completed.

Variations from this plan are evaluated to determine if the program status is different from that which was anticipated when the job started, or different from the best work information as to how it will progress.

6. By providing NAVSHIPS with the same information the Contractor uses, we believe a valuable communication link can be established, since this information is used at all levels and by all departments in the Division. This will avoid the necessity for translating anticipated costs from the Contractor's cost reporting system to some other cost reporting system.

7. It is requested that NAVSHIPS review the attached data, and approve the same as meeting the requirements of the contract. If there are any questions relating to any aspect of the proposed report please contact us and we will be happy to answer them.

Very truly yours,

GENERAL DYNAMICS
Electric Boat Division

/s/ E. Holt

E. Holt
SSN688 Class Program Manager

TM:ihc

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cc: Mr. J. Wakefield,	PMS 393	w/o encl.	
Mr. D. Matteo,	PMS 393	w/o encl.	
Mr. JJ Jensen,	SOS	w/encl.	
Mr. J. Cushing,	SCS	w/o encl.	
Mr. AM Barton	w/o encl.		
Mr. EJ Behney	w/o encl.		
Mr. TS Cramer	w/o encl.		
Mr. RK Gregory	w/o encl.		
Mr. TL McPherson	w/o encl.		
Mr. ZJ Noga	w/o encl.		

③

6/22/76 G E MacDonald

McGuffee - Got offer from Fairchild
where they have big problems on A-10
aircraft $100,000 3yr. contract

Max Golden meeting with Schrade on 6/23
to discuss alternative to Clements
plan since NPN and Ingalls rejected
the public law approach to settling
the claims

Nardone will take over for McGuffee
and Conyer will be airapparent
but won't have title

Claim estimate of $300MM includes ✓
ripple effect where position is very weak

letter from Max Golden to Norm
Victor telling Norm what schedule
to use for purposes of the claim
Studies of NPN - Two separate schedules
One for the Navy one for EB.
Schedule slippage has major impact on
amount of claim and EB has to get
number up as high as possible

Genuine

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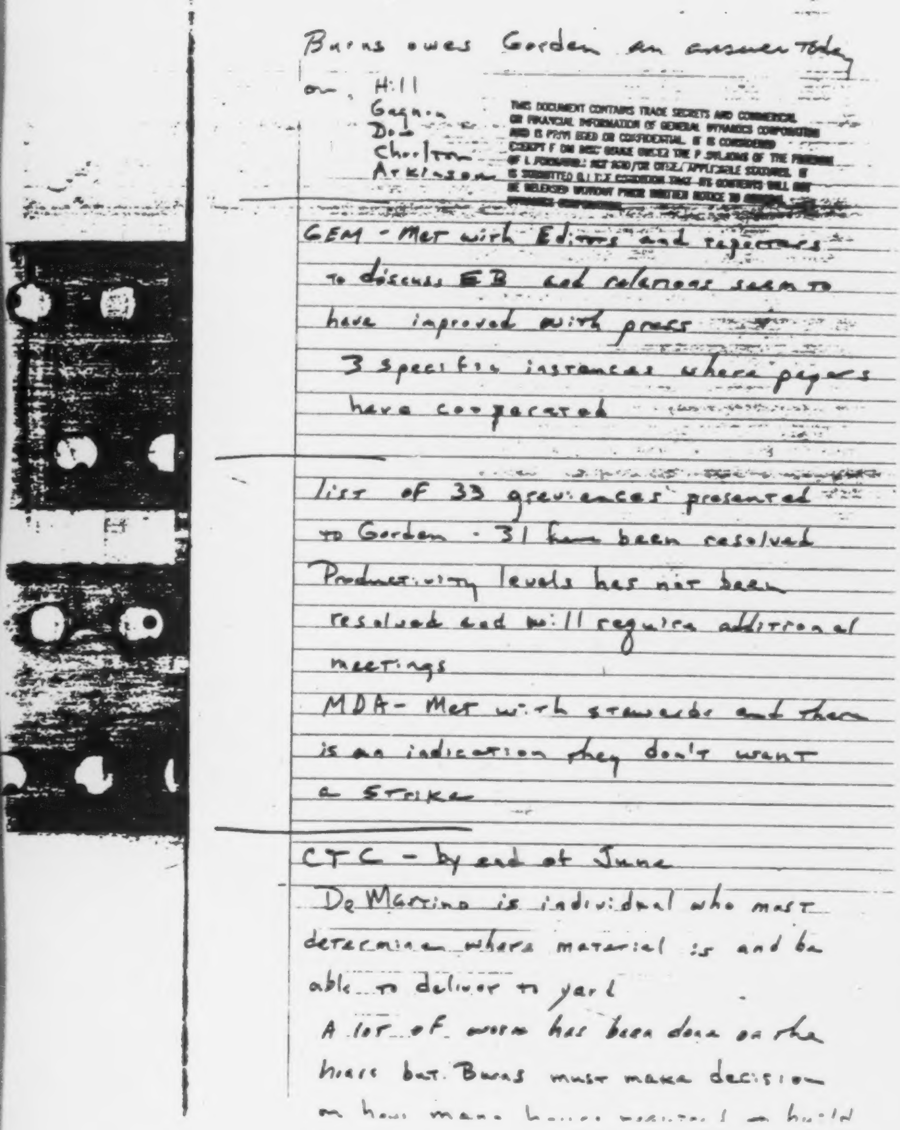

Burns owes Gordon an answer Today

on, Hill
Gagnon
Don
Charlton
Atkinson

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GEM - Met with Editors and reporters
to discuss EB and relations seem to
have improved with press
3 specific instances where papers
have cooperated

list of 33 grievances presented
to Gordon - 31 have been resolved
Productivity levels has not been
resolved and will require additional
meetings
MDA - Met with stewards and there
is an indication they don't want
a strike

CTC - by end of June
DeMartino is individual who must
determine where material is and be
able to deliver to yard
A lot of work has been done on the
hours but Burns must make decision
on how many hours required to build

Major cuts in overhead and support people must be made by Friday by the individual mgrs or else GEM has indicated he will make arbitrary cuts

Detailed estimate on both Flites of 88's which should give much better estimate

Daily meetings to review an individual boat - All key people are present Each boat is reviewed every 10 days

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④

MEETING AT NAVSEA RE 688 CLASS REA
OCTOBER 17, 1975

Navy attendees were the following:

LCdr. E. B. Harshbarger, SC, USN
J. M. Taylor, 08
C. M. Ross, Counsel, SOS, Groton
D. W. Jones, 00L
J. R. Wakefield, 393B
D. Matteo, 393

Electric Boat Division attendees were the following

A. M. Barton
W. Gorvine
J. W. Rannenberg
E. W. Shepherd

The following is not a transcript, but is based on notes prepared by the Electric Boat participants before and during the meeting.

Immediately after opening the meeting, LCdr. Harshbarger invited Mr. Rannenberg to proceed. Mr. Rannenberg stated that we have a counter-offer and that we would like to explain what our thinking was in arriving at our offer. It is not our intention to try to thrash out anything now but we wanted to tell you our conclusions in arriving at the counter-offer.

It is an offer for settlement of both flights and the Overhead Ceiling. It is structured within the constraints you told us you had in dealing with a prompt settlement. We have kept the offer within the first contract and the amount within the envelope of the REA. We want to remind you that the REA was a cost number and the settlement that we are now talking about is a contract adjustment, with the ceiling number being the important one. You should keep this difference in mind.

We had considerable difficulty in trying to bring the second flight into the offer at this time. However, the company is making a sincere effort to reach a settlement now because of serious cash flow problems which would otherwise result and because you do not contemplate going along with provisional payments. That brings a great impetus to settle as soon as possible.

This is how we assess some of the more important areas of the REA.

In the case of delay and delay-related costs, we can see no basis for a significant difference as to either the facts or entitlement in this area.

In the case of interest costs, we have taken into account the applicability of the DPC you have cited as relevant here; however, it should be recognized that non-recoverability of interest reinforces the Government's duty to arrive at a prompt settlement, or make provisional payments.

In the area of unsuitable data, we consider the increase in scope of work represented by the weight changes that have taken place from the Government-Furnished Contract Design Weight Estimate to be clearly a matter of Government-responsibility and readily quantifiable as shown in the recent EB weight presentation. Concerning the complexity portion of the unsuitable data area, we consider that the engineering presentations by EB clearly establish substantial Government liability in areas other than pipehangers and foundations, which were already acknowledged by the Navy.

Material escalation has been recognized as an area of Government liability, the only difference between the parties being the appropriate measure of the amount. Electric Boat still considers that it is entitled to recover for this item on the basis of the phasing of the material escalation table in the contract. However, we also feel that we can reach a reasonable resolution on the basis that the Navy has preferred to use, and we have taken this into consideration in our offer.

Disruption, although a significant element of the REA, has not been discussed at any great length. As we understand it, the Navy has said that because the quantum has not been specifically "proved" that they should reject the entire item, even though it has acknowledged that events such as those which have occurred in the 688 program inevitably cause disruption. Though real and costly, disruption by its very nature is difficult to prove, especially in a forward pricing situation. Once returned costs of a ship or contract are available, the quantitative effects of disruption become much more readily apparent. We therefore differ with the Navy's position on disruption and consider that the use of a factor, based on prior experience with the effects of disruption on the cost of construction of nuclear submarines, is an appropriate way, and perhaps the most meaningful way, of quantifying disruption costs under forward pricing conditions.

Mr. Barton stated the following:

We need to discuss the basis of the 688-II claim estimate in order to appreciate the dimensions of the potential claims on the SSN688 Program --

that we are attempting to resolve at this time. In view of the status of the program, it is evident that the forecasts are still very much in front of us, since only the first two ships have any substantial amount of work accomplished on them. The Company is looking at an overrun to the target cost in the $400,000,000 range and obviously the possibilities of an overrun in excess of this amount exceed the possibilities of any significant underrun. As you can see from the cost reports submitted to you, we are still being quite optimistic about cost on future ships. The reason for this is not because of any serious question regarding the amount of work inherent in building the ships, but rather whether or not we can achieve the level of productivity we feel is possible. Some of the things we have in mind which would enable us to improve our costs are the work practices improvements which the Navy is aware of as a result of our recent union negotiations.

In order to decide the amount of the work increase of 688-II which is attributed to Government responsibility, it was necessary to review the situation as it existed in the Spring of 1973 when we were preparing our estimates. The returned costs at that time in our accounting system in the 300 through 900 accounts, which are those accounts which reflect the scope of work, were approximately 300,000 manhours on the 690 boat and a trifling amount on the follow ships. We were experiencing some problems at that time, but we had attributed them to the late data and the disruption caused by it and thought that these problems could be overcome and would not affect the follow ships. For this reason, if you were to look at our bid, you would note that the 688-II estimate was based on the same manhours that we had bid for 688-I. It is interesting that the Government's view of the cost picture was not different from the Company's. During the course of the negotiations of 688-II, the Government advised us that their estimate for the ships was slightly less than the Company's -- I believe, 100,000 manhours per ship less than the Company's -- and that since this difference was not significant to the course of the negotiations, a detailed discussion of the estimated manhours was not held.

The original delivery date for the SSN688 was August 1974. On December 31, 1973, one month after Electric Boat contracted for the second flight of ships, the schedule for SSN688 was extended to February 1975 -- about a six-month extension. In February 1974, it was again rescheduled; this time, to June 1975. There have been two subsequent reschedulings, and the current official delivery date is November 1975. The Navy is recognizing about a three-month further schedule delay, although Electric Boat Division believes that it will be even later than that. Obviously, these continuous schedule problems have an effect on the 688-second flight.

With this background, we assessed the cost overruns on 688-II to determine how much of the cost overrun was Government responsible. The estimate was not difficult to make since there has not been any amount of work done on 688-II so we do not have disruption and such things as appear in the 688-I REA. Basically, the increases are related to the unsuitable data, scope increases which continue from 688-I to 688-II, and also certain "ripple effect" costs which arise because we were not able to get our production plan on 688-I underway as well as anticipated and certain assumptions had been made in this regard in preparing the 688-II estimate. The total amount estimated to be Government responsible overruns on 688-II is $190,000,000. The delay cost, that is, the pure economics of the schedule slip, is estimated to be $60,000,000. The unsuitable data portion, that is, the scope of work which is the result of the unsuitable data, is $110,000,000, and the ripple effect discussed above is $20,000,000.

At this point, LCdr. Harshbarger asked Mr. Barton for a point of clarification, i.e., was Mr. Barton referring to "loss of learning" as representing the $20 million segment as he had just mentioned. Mr. Barton replied in the affirmative.

Mr. Gorvine stated that we do not feel that there is any serious doubt that delay costs on the first flight contract flow directly into the second flight contract. He said that we feel that a "two contract" defense as a legal defense would fail. In cases where the two contract defense has been successful, the decision has hinged entirely on the facts associated with the specific case. He cited as an example the SSN638/SSN649 claims filed by General Dynamics, Quincy Division with the ASBCA where the Board, although denying Quincy's cross contract entitlement, did acknowledge that changes on one contract could give rise to a claim on another contract under appropriate factual circumstances. Mr. Gorvine also read a portion of a pre-trial order by the ASBCA as quoted below:

> "Instead, he /the contracting officer_/ asserted categorically that as a matter of law changes made under Contract No. NObs-4355 could not give rise to claims for an equitable adjustment in contract price under Contracts Nos. -4509 and -4583 and cited the Board's decision in Lehigh Chemicals, ASBCA No. 8427, 1963 BCA, par. 3749, and Hicks Corporation, ASBCA No. 10760, 66-1 BCA par. 5469, in support of this alleged rule of law..."
>
> "The legal rules relied on by the contracting officer are not correctly stated..."
>
> "As to the so-called "two-contract" defense the Lehigh and Hicks decisions merely hold that a contractor

> cannot recover business losses, which he ascribes to the performance of a change, as part of the equitable adjustment in contract price on account of such change. But it does not follow, conversely, that acts of the Government in the administration of one contract (here: NObs-4355) may not result in a constructive change, suspension of work or excusable cause for default in respect of other contracts (here: NObs-4509 and -4583) and a valid claim thereunder. For examples see Valley Forge & Car Co., ASBCA No. 1924 (1956); Aremco Products Co., ASBCA No. 9491, 65-1 BCA par. 4572."

Mr. Gorvine also cited a recent claim settlement between the U. S. Navy and the Avondale shipyard which included a two-contract follow-on situation not unlike the first and second flights of 688's. In this case, the U. S. Navy settled the claim without even raising the two-contract defense as a legal bar. He also noted that in the Litton Project X appeal, presently pending before the Board and involving cross-contract effects, the administrative law judge had made a statement from the bench rejecting the argument that a two-contract situation constituted an automatic legal bar to recovery under the second contract. He said that it is clear to us that the second contract defense would not prevail under the facts of this case.

With respect to unsuitable data, Mr. Gorvine stated that the Navy had previously mentioned that when Electric Boat bid the second flight it knew, or should have known, the circumstances pertaining to the unsuitable data and therefore assumed the risk. He pointed out that, while Electric Boat was aware of some of the problems, which it was attributing to late design information and which it thought would be solved before the second flight, Electric Boat could not have known the magnitude of these problems and their effect on cost. He stated that the Navy itself presumably did not know the extent of these problems because the Navy's own estimate of manhours per ship, as discussed in the second flight negotiations, was 100,000 less than Electric Boat Divisions. Mr. Gorvine stated that this was an important consideration because the Navy, as over-all manager of the entire SSN Class program, had superior knowledge concerning the status of the program as a whole and would have known of any significant future problems likely to develop on the 688 Class if anyone could reasonably have known. Despite this superior knowledge the Navy itself apparently did not foresee, any more than did Electric Boat, the magnitude of the problems of unsuitable data which would subsequently develop. Mr. Gorvine further added that, if the facts should disclose that the Navy, with its superior knowledge of the status of the SSN688 Class program, actually did know of the magnitude of the unsuitable data problems but failed to make this knowledge known to Electric Boat prior to establishment of the contract price, and even negotiated Electric Boat's proposed price downward, we were convinced that such a circumstance would give rise to a significant liability on the part of the Navy.

At this point Mr. Gorvine summarized what he had already said regarding the two-contract defense as a legal bar to recovery on the second flight contract and regarding the question of Electric Boat's assumption of risk with respect to the unsuitable data as a result of our having known the situation pertaining to the unsuitable data at the time of the second flight contract. He expressed a strong belief that we would prevail on both of these issues in a litigation before the ASBCA or the Court of Claims. He added that, while we have struggled to confine our counter-offer within the constraints set forth by the Navy and have therefore applied a large discount factor for litigation risk on the second flight, we have no intention of just giving away our rights on the second flight.

Mr. Gorvine stated that we had been talking so far about entitlement to an equitable adjustment under the two contracts. He noted, however, that as part of an evaluation of the entire situation, the Navy should be aware that substantial grounds exist in our opinion for challenging the legality of the first and second SSN688 Class contracts and the Overhead Ceiling Agreement. At this point, LCdr. Harshbarger requested Mr. Gorvine to be more specific concerning the basis for the challenge to legality that Mr. Gorvine had just mentioned, particularly with regard to the two 688 contracts. Mr. Gorvine replied that he did not want to elaborate on this issue in too much detail at this time since we hope that it does not become necessary to pursue this course of action, but made the following comments:

1. A principal basis for challenging the legality of both 688-I and 688-II contracts is that the Navy failed to comply with the Department of Defense contract policies and requirements ultimately set forth in DOD Instruction 5000.1. He stated that, under the requirements of DOD Instruction 5000.1, the Government should have used a cost-reimbursement type contract in lieu of a fixed-price type contract for both flights because the 688 Class program was at too early a stage of development at the time of contract award to warrant the use of fixed-price type contracts.

2. In the case of the 688-II contract, if the Government at that time knew the magnitude of the problems being encountered on the 688 Class program, and failed to disclose its superior knowledge prior to establishment of the contract price, this might also afford a basis for challenging the legality of that contract.

3. With regard to the Overhead Ceiling Agreement, Mr. Gorvine stated that the recent legal opinion from the firm of Sellers, Connor and Cuneo concerning the interpretation of certain provisions of the Overhead Ceiling Agreement, had independently indicated the existence of serious questions of legality. He said we had discussed this further with outside counsel and had concluded that several bases existed for challenging the legality of this agreement, including absence of consideration as one basis.

Mr. Gorvine stated that we consider Electric Boat to be entitled to receive progress or provisional payments on account of the additional work required, especially in view of the magnitude involved and in view of the substantial liability which has in effect been acknowledged by the Government. He said that we do not consider the NPD which the Navy has cited as governing provisional payments as constituting a regulation having the force of law or as binding upon Electric Boat. He said that this view is reinforced by the Navy's position that interest on borrowings to finance performance of the additional work is not allowable and by the fact that the current negative cash flow to Electric Boat on the 688 program is approximately $150 million. He said that continued failure on the part of the Government to make progress or provisional payments on account of additional work represented by the REA might well constitute a material breach of contract on the part of the Government. He added that Electric Boat would prefer to avoid this question, if possible.

LCdr. Harshbarger stated at this point that he wanted to clarify the Navy's position on provisional payments. He said that his statements made at a previous meeting were not intended to "pre-judge" whether Electric Boat would in fact receive provisional payments but that he had previously mentioned the NPD requirements that had to be complied with by Electric Boat in a request for provisional payments. Mr. Rannenberg commented that we viewed the NPD requirements as meaning that a company had to be close to bankruptcy in order to obtain provisional payments and Mr. Gorvine added that the imposition by the Navy of the NPD requirements as a necessary condition to their making provisional payments was tantamount to a refusal to make provisional payments in Electric Boat's case.

Mr. Barton said that he wanted to bring up the current discussions on the Overhead Ceiling Agreement being held in Groton between Electric Boat and the DCAA. He said that, out of a $70 million overrun using the Government's entitlement position, DCAA's assessment of the "value" in terms of the profit and loss effect, was $50 million while Electric Boat's assessment is $35 million, including the effect of the current strike. He said this Electric Boat evaluation was the result of a detailed contract by contract evaluation which had just been completed and that we were satisfied that our calculations are correct. He said that $8-10 million of the difference between the Electric Boat assessment and the DCAA assessment was due to the failure of DCAA to take into account ASPR disallowances - i.e., if the Overhead Ceiling Agreement were cancelled, ASPR allowability rules would still apply and would affect the amounts actually paid by the Government. The remainder of the $15 million difference may depend largely on whether you think we will be on the 70/30 shareline on the 688-II contract. We want you to be aware of our position especially with respect to the ASPR disallowances treatment. Mr. Rannenberg added that we want to emphasize that we do not consider that the $50 million or th $35 million figure represents the value of cancellation of the Overhead Ceiling Agreement in view of the interpretation and legality questions which have previously been discussed. LCdr. Harshbarger stated that the final Government position on the Overhead Ceiling Agreement, including the treatment of ASPR disallowances, will be his and not the DCAA's. He said he may want to meet with Mr. Barton at some later time and discuss this calculation in more detail so that he properly understands it.

Mr. Rannenberg stated that we have reduced our counter-offer to writing in the form of a contract modification and release, as the Navy had done with its original offer on the REA. He then proceeded to summarize the key features of our counter-offer as follows:

1. Electric Boat would release rights under both contracts with respect to events prior to May 1975.
2. Regarding the 688-II contract, there would be an adjustment only of delivery dates.
3. There would be some relatively minor exceptions to the release of rights.
4. The ceiling price of the 688-I contract would be increased by $185 million.
5. The Overhead Ceiling Agreement would be cancelled *ab initio*.

Mr. Rannenberg then handed out copies of the attached contract modification and release identified as Draft - EB - 10/17/75.

There was then a recess of approximately one hour held at the request of the Government so that they might review in private the Electric Boat counter-offer. At the end of the recess LCdr. Harshbarger returned to the meeting alone.

LCdr. Harshbarger stated that the Government understood the various provisions of the draft release submitted by Electric Boat.

He stated that he wanted to make it clear that the Government did not concur with all the presentations which Electric Boat had made in the course of the meetings. He said that this was a "speech he had to make."

LCdr. Harshbarger said that the Navy negotiating team is "shocked" at the magnitude of Electric Boat's counter-offer. He said he recognizes it was within the parameters but that they do not feel that we adequately assessed the Government's responsibility for the REA itself, the second flight and the Overhead Ceiling Agreement. From the size of the number here, the Overhead Ceiling Agreement is assessed by Electric Boat as a minimal liability but the Government does not take that view.

LCdr. Harshbarger said that "shocked" is the best way to describe how the Government views Electric Boat's counter-offer. He said they will look at it and their first determination will have to be whether there is any basis to continue toward settlement in a "negotiated fashion." He said he would get back to us as soon as he could concerning what that assessment is. Mr. Rannenberg asked LCdr. Harshbarger whether we could expect to hear from him the early part of next week and LCdr. Harshbarger said that it would be later than that.

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GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: J. F. Burns

Date June 11, 1976

FROM: G. G. Johnson

FILE NO.: 634/GGJ/76-152

SUBJECT: I.E. Plan

REFERENCE:

Enclosure: (1) I. E. Plan

I have reviewed the previously submitted Industrial Engineering Plan and have concluded that it suffers in many respects. I have, therefore, taken the opportunity in the past two weeks to sit down and put on paper where it is I think we should begin.

My assessment of the Division's current posture - as I am sure you have gathered - is rather pessimistic. I am further concerned that we do not appear to be taking firm steps in the direction of developing a comprehensive plan for improving the situation. Perhaps if you understand my feelings in this matter, you will understand why I occasionally permitted the scope of Enclosure (1) to spread beyond the boundaries of I.E.

For obvious reasons, I have not reviewed those portions of the plan having to do with organization with any of my managers. The question of headcount is one we should not discuss until we have settled some of the questions on function.

G. G. Johnson

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INDUSTRIAL ENGINEERING PLAN

1.0 Context

In assembling a plan for the use of resources within the Industrial Engineering Department, certain "givens" were defined. These "givens" provide guidance in setting directions for I.E. and establish very real constraints upon the alternatives considered.

1.1.0 Division Manhour Commitment

Yard direct hrs

The Division has established a Cost-at-Completion commitment of 31,000,200 manhours on 688-I. This commitment is both unrealistic and unachievable. A continuation of performance at its historical levels (156% including supervision) will result in a final contract cost (excluding contract changes) of 36,684,000 manhours. (See Exhibit 1)

The existence of planned objectives implies the existence of a process of measurement against those objectives. Measurement of Division performance against a baseline of 31 million hours is tantamount to no measurement at all. Worse, the cynicism bred by constant reference made to an unachievable target poses the risk of worse, not better performance.

1.2.0 Division Schedule Commitment

To the extent that "the schedule" serves as a device for communicating with the customer, it may or may not be effective. To the extent that it serves as a baseline for driving the production plan, it is inadequate. The mere fact of the existence of some ten to twelve thousand B/M delinquencies should be evidence enough that the baseline is not useful. To the extent that resources are committed and expended in pursuit of unachievable goals, they are expended in vain.

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1.3.0 Management Acceptance of Industrial Engineering

Industrial Engineering, as it is currently organized, is a "staff" function with an advisory role. Effectiveness in such a role derives in no small measure from strong management support, as well as from competent engineering and diligent follow through. Support from management has been conspicuous by its absence in the past. Faced with severe and continuing pressure for cost and schedule improvement, management has tended to turn to those with "line authority" and who appear to be in a position to direct changes.

Despite the literally hundreds of studies, plans and recommendations made by Industrial Engineering (and others), the Division continues to conduct business as usual. Business as usual means:

- 688-I costs are out of control
- key event schedules continue to slip
- Special Property is still uncontrolled
- the Division has two separate cost accounting systems
- the Division has two separate progressing systems
- shipyard manning is poorly matched with available work
- material doesn't appear on schedule
- the trades work partials and out of sequence
- there are still no valid measures of the capacity of the shipyard (1) to perform work, (2) to utilize machines, (3) to employ people
- data processing costs are up; service is down costly
- there are major discrepancies in the production plan between key events and feeder details
- work occurs before or in spite of the paper issue date
- etc.

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2.0 Objectives of I.E. Plan

It is critically important, in view of the foregoing, that I.E. negotiate or be assigned objectives which are both relevant and achievable. For example, the simple objective of cost reduction is irrelevant so long as a valid baseline for its measurement is absent. Such global objectives also lead to a diffusion of effort simply because they are too broadly stated. Industrial Engineering can make contributions in three areas, given that Division objectives are stated realistically:

2.1.0 Produce, for the Division, a realistic cost performance baseline.

This objective involves both the definition of initial parameters (values) and establishment of a mechanism for maintaining the cost performance baseline on 688-I.

2.2.0 Continue to perform assigned or chartered production support functions within assigned budgets.

This objective recognizes that approximately 2/3 of the personnel assigned to the department perform routine "service" functions.

2.3.0 Pursue opportunities for major, specific cost-reductions.

In meeting this objective, Industrial Engineering can pursue both the Division's commitment and its own need to establish a clear, vigorous identity. To qualify under this heading, opportunities must be identifiable in advance and their resolution consistent with other Division objectives.

(The Business Systems Applications Review - expected to result in the development of a 1977 data processing plan - serves as a useful model. Other similar opportunities can be identified in advance.)

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2.4.0 Upgrade Qualifications of Personnel

Of the 286 personnel assigned, 133 (47%) hold degrees; breakdown is as follows:

BSIE - 39

MSIE - 8

Other BSE - 37

Other MSE - 0

Partly for historical reasons and partly as a result of development policies over the past few years, the I.E. degrees tend to be concentrated among younger, more recently hired persons. An upgrade in the capabilities can and should be taken in conjunction with a general headcount reduction.

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INDUSTRIAL ENGINEERING
(6/10/76)

	BS	MS	PhD	BS ASSOC.	TOTALS
INDUSTRIAL ENGINEERING	39	7	1		47
ELECTRICAL ENGINEERING	8			2	10
MECHANICAL ENGINEERING	16			5	21
BUSINESS ADMINISTRATION	4	6	1	1	12
MANAGEMENT	2	1			3
INDUSTRIAL MANAGEMENT	5	1			6
ENGINEERING MANAGEMENT	1	1			2
INDUSTRIAL ADMINISTRATION	4				4
INDUSTRIAL SUPERVISION				1	1
INDUSTRIAL ENGR. TECHNOLOGY	1				1
INDUSTRIAL TECHNOLOGY	2				2
ELECTRICAL TECHNOLOGY	1				1
ENGINEERING TECHNOLOGY	1				1
CIVIL ENGINEERING	2				2
CHEMICAL ENGINEERING	1				1
NAUTICAL ENGINEERING	1				1
MARINE ENGINEERING	2				2
MANUFACTURING ENGINEERING	1			1	2
AEROSPACE DESIGN				1	1
ENGINEERING PHYSICS	1				1
MATHEMATICS	2				2
ACCOUNTING	1				1
MARKETING	1				1
FOREIGN LANGUAGE	1				1
FORESTRY	1				1
GENERAL SCIENCE	1				1
PHILOSOPHY	1				1
PSYCHOLOGY	1				1
SOCIOLOGY	1				1
ENGLISH	1				1
EDUCATION	1				1
TOTALS	104	16	2	11	133

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3.0 Problem Statement

The Division's major problem can be factored into four elements. The Division's major problem is excess cost.

3.1.0 Continuing Cost overruns in direct production work

Performance to date is 156% to the standard. Performance since the strike is averaging only slightly less (Exhibit 2). Efforts towards a continuing improvement continue to be plagued by every imaginable obstruction:

- late paper
- rework
- plan revisions
- lack of material
- out of sequence work
- poor methods
- inadequate supervision
- lost material
- unskilled labor
- etc.

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3.2.0 Excess cost of production support personnel

Production support costs continue to run at what are judged to be excessively high levels. There are currently 3228* supervising, indirect, and direct production support personnel for 10,307 direct production personnel (Groton and Quonset). The vast majority of these are directly involved in the planning and control of production work.

Production planning is a highly labor intensive process characterized by "do it the way we did last time planning" and "let's get all the delinquencies out at a meeting" control. Substantial quantities of paper are produced yet many of the trades maintain supplementary detailed planning and control systems of their own.

*Planning, Production Planning, Industrial Engineering and Operations supervision.

Industrial Engineering is viewed largely as an organization whose chief purpose it is to place someone on report. Industrial Engineering admittedly wastes a great deal of time and money:

- wondering what its role is
- defending its existence
- devising methods to compensate for unplanned production evolutions (torpedo sleeves SSN 701, machinery alignment on 696, etc.)
- gathering information.

3.3.0 Excessive backlog of material

[illegible] The Division recently leased a modern, high utilization warehouse. This event was a testimony to the fact that:

Audit Rs ....>
- we have a lot of the wrong material
- we don't plan and control our storage space effectively.

Excess material generates three types of excess costs:

- "BN" costs - in-process stowage so jammed that the material gets lost - for awhile
- "Waterford Warehouse" costs - the raw cost (excluding investment) of storage

Audit ....>
- "multiple manufacturing" costs - excess investment and storage costs of uncoded material we made to save money. (See Exhibit 3)

3.4.0 Management Systems and Information Costs

The most obvious symbol of excess cost in this area is the computer. The computer is blamed for everything from lost material to chipped paint. It is generally acknowledged to be out of control.

More pernicious, if only because it is less obvious, is the excess cost associated with the tangle of manual systems supported by the Division. The sheer manual effort required, for example, to clear a rejection or divert a line item of material from its recorded end use is enormous.

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4.0 Issues for Top Management

The effort required to gain control of costs in the Division must be a joint effort involving top management as well as operating management. In order for management in general to perform its tasks, top management must release the artificial but real constraints under which the Division attempts to plan and control its work. At this point, top management must then re-establish a new and more promising set of "givens" or objectives which can be translated into more efficient and effective operations.

4.1.0 Schedule

There are a number of interrelated actions which should be taken in connection with the schedule (See Exhibit 4). The current practice is that the schedule drives a number of the Division's key operating systems. To the extent that the schedule is unrealistic or one of the several operating systems (e.g. production control) does not follow the schedule, the smooth functioning of the overall system is destroyed.

Management should direct the implementation of an operating schedule to drive the several operating subsystems in a coordinated fashion. Variances between the operating schedule and the "official" schedule should be summarized and reported so that a true schedule baseline is maintained and tracked. All "recovery plans" (plans designed to "recover" the official schedule) should be made explicit and formally incorporated into the operating schedule. All operating subsystems should be driven by the operating schedule.

4.2.0 Organization

Recent organizational changes have created a vacuum of purpose. Although it is recognized that certain changes were made in conjunction with management changes, nonetheless, there remain a number of unresolved organization issues:

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4.2.5.0 Directors in General

There are too many people reporting to the General Manager. This is a direct indication that top management does not articulate its own priorities.

4.3.0 Operating Philosophy

The key issue facing the Division follows directly the answer to one simple question:

- Does the Division formally recognize that whatever it is it is doing, there has to be a better way?

If the answer to the above is "yes", then the key issue demanding management's attention is the initiation and management of change.

There are many factors in the local environment and in the way we do business which combine to produce a natural resistance to change - besides plain old human nature:

- 55 acres on the side of the river - means that facility changes tend to be marginal compromises
- formal separation of "engineering" and "production" reinforces image on production side that engineering won't work when it comes to ship construction
- historically fluctuating employment levels - the feeling among blue collar and white collar workers that this is just a place to work
- adverse planning economies - at any particular point in time, the marginal economics of altering the way we do business generally appear unfavorable - it's easier to continue past practices because people remember them, they appear to have worked, and there is never any direction to the contrary.
- a legitimate fear in top management that - if called upon - we couldn't write down all the things required to build a submarine
- a management development process that staffs the production support areas with ex-trades personnel thereby solidifying further the old way
- an "organizational" perspective on problems which leads to organization changes but few changes in the things people do.

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4.4.0 Dealing with the Customer

The fact that we have only one customer seems to blind us to the fact that he has only one E.B. As a consequence, we appear willing to take a loss on each boat in the hopes that we can make it up in volume.

Our compliant attitudes towards customer generated "needs" has caused us to:

- start construction before the design is stable
- accept multiple changes to that design after construction is well along
- design operating control systems which soothe the customer but do not necessarily lead to profitable operations
- produce an organization structure which is unmanageable
- deal with problems in a piecemeal fashion
- kid ourselves, more often than not.

A clear, unequivocal, written policy on customer relations would be a tonic to the Division. The policy might mention that:

- EB is a division of a profit-seeking commercial enterprise
- customer "engagement" hereafter will be severally restricted to legitimate, contracturally required incursions.

4.5.0 Management Information

Division top management currently receives status information on a rather "hit-or-miss" basis due to a lack of reporting discipline. Related, but uncoordinated, bits of data arrive in varied format, detail and frequency. Essential messages or requirements for executive action are not readily discernible. Information in conflict, which should be resolved at lower levels, arrives unresolved. Top management is left with the task of sorting the important from the unimportant, the executive decision items from the purely informational items, etc.

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Required to overcome this is a clear statement of Division objectives, the development and acceptance of a plan in support of those objectives, the assignment of organizational responsibility for accomplishing pieces of the plan and a set of measures which track to the plan.

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5.0 Industrial Engineering Contributions

Industrial Engineering employs resources (personnel, financial and capital) in support of two broad areas of activity:

- routine, reasonably well-defined tasks in support of either the production process or the planning and control process
- emergent work activities - generally special studies or projects - which require industrial engineering technical input or are relative to basic industrial engineering functions.

This plan makes explicit the distinctions between the two kinds of activities much in the way that an automobile owner makes a distinction between wheel bearings and pin stripes. The former is necessary just to make the car go. The latter is an extra which may or may not increase the value of the car.

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5.1.0 Chartered Industrial Engineering Service Activities

	FUNCTION	HEADCOUNT Current	HEADCOUNT Possible
635	1. Cost Performance Reporting - various	20	-10
	2. Cost Variance Analysis -	6	
	3. Earned Value Input	20	-10
	4. Baseline Maintenance	5	
	5. Activity Sampling	2	
	6. Standards Development	4	-8
676	7. Systems and Procedures	13	
	8. Data Systems Control	3	
393	9. Handling/Storage Engineering	8	
	10. Facilities/Equipment Engineering	13	
	11. Shipyard Processes	12	
	12. Shipyard Standard Procedures	8	
	13. Producibility Review (TRIDENT)	14	
	14. Tool Design	23	
	15. Transportation Engineering	5	
	16. Tool Engineering	13	
	17. 393 Clerical/Staff	12	
	18. Clerical (various)	10	
		191	

5.2.0 Contributions towards reducing cost overruns in direct production work

5.2.1.0 Required Outcomes

- Increase, substantially, the level of "material availability" for installation work.
  - 1. adopt valid schedule baseline to preclude using scarce capacity to produce ahead of real need date
  - 2. increase emphasis on real delinquencies.

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5.2.1.0 Required Outcomes (Continued)

- Establish a valid configuration for 688 Class construction. Develop a mechanism to identify and classify emergent work at the wet dock areas to improve performance visibility and to provide quicker and more reliable justification for contract improvements.
- Establish a Division-wide policy that work will be completed by the production area to which it is assigned. Conduct a program to reduce the number of DWO-type work transfers.
- Upgrade substantially the level and professionalism of in-process inspection. Strive to eliminate the shipment of bent decks, tanks with reversed members, frames without chamfers, etc. that are the cause of substantial amounts of rework in the installation areas.
- Establish clear lines of authority and responsibility for cost and schedule performance within the Operations Department.

5.2.2.0 Specific Industrial Engineering Tasks

△ Spotlight Cost Improvement

- Develop an ongoing prioritized list of specific shipyard tasks to be engineered for improvement. Tasks to be selected and assigned priority on the basis of past budget performance and hours required, (i.e., a 2,000 hour task running 200% of budget would be investigated prior to a 1,000 hour job running 110% of budget).
  - Focus Industrial Engineering talent to the areas which which have the most potential return
  - Develop a group of production engineers with the capability to optimize the methods, tooling and producibility of individual shipyard tasks.
- Identify and categorize root causes of cost performance variances
  - Paper problems
  - Methods
  - Materials
  - etc.
- Identify next similar job in sequence and define conditions required for cost improvement. Identify responsibilities to assure conditions are met. Track commitments.

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Spotlight Cost Improvement (Continued)

- Accumulate variances as a basis for identifying generic production support, training, supervision kinds of problems on a broader basis.

Contributions:

- Direct cost reduction possibilities through formalized capture of experience and transfer of experience to downstream tasks ("learning").
- Establish a basis for continuing upgrade of production support functions.
- Direct, hands-on application of Industrial Engineering skills.

Site Producibility Project

- Form a producibility team in the specialized areas of mechanical, structural, piping and electrical whose task would be to review the work at the S8G Site periodically.
    - Convert available information from the S8G Site into factual changes for use on the TRIDENT ship.
    - Check current issued and preliminary drawings against actual utilization of these drawings at the S8G Site. Recommend appropriate drawing changes.
    - Establish a schedule, using key events and other important construction phases, to determine the most advantageous time to conduct trips to the S8G Site.

Contributions:

- Avoid reinventing the wheel in the development of tools, methods, layout and sequences.
- Capture "learning" aspects of site experience.
- Cost avoidance opportunities by not repeating unforseen problems.

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△ Special Property and Major Tooling Utilization

- Evaluate utilization, handling, storage and disposition of Division Special Property and Major Tooling items.
- Conduct post-acquisition audit of economic benefits derived.
- Evaluate design in field areas.
- Develop a special property control system.
- Initiate disposal of underutilized special property and major tooling.

Contributions:

- Establish a more cost effective set of criteria in connection with the justification and acquisition of special tooling.
- Decreased cost of special property/major tooling through follow-up reporting and control.
- Improved utilization through control reporting and identification to user.

△ Establish a Shipyard "Problem Central"

- Set up an office and a small staff to handle shipyard initiated problems/questions.
- Establish a mechanism for recording, summarizing, and following up on inquiries.

Contributions:

- Reduce confusion existing among shipyard personnel in connection with the appropriate production support department to call for assistance.
- Improve the responsiveness of the production support operations in a constructive fashion.

△ Area Manloading

- Establish on a production area basis the requirements for Production Control to meet its detailed manpower planning objectives.

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Area Manloading (Continued)

- Develop for each production area the approach and detailed procedures required to develop an area manload plan.
- Identify software requirements necessary to support manloading.
- Produce for each production area a Manload Procedure (or its equivalent).

Contributions:

- Reorient Division manpower control policies in the direction of applying manpower to schedule availabilities rather than to the schedule in the absence of available material.
- Reduce excess cost created by the presence of scheduled manpower over and above material availabilities.

△ Revise Operations OBS/WBS

- Establish on behalf of the Operations Director a revised OBS/WBS structure.

OBS-

- Establish a simplified OBS coding structure consistent with a revised Operations Department organization structure as a basis for sorting cost and schedule performance reports. Recode data processing files as appropriate.

WBS-

- Initiate revisions to the Management Account Dictionary to simplify the collection of cost and schedule control information.
  - devise a mechanism for "capturing" such revisions on issued work packages.
  - implement a crosscharge reporting mechanism.

Contributions:

- Establish clear lines of authority and responsibility within Operations.
- Provide a uniform basis for the possible application of C/SCSC to 688-I.
- Reduce the complexity and cost of the Shipyard Direct Labor Cost Control System.

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△ Trade Entry-Level Training Requirements

- Establish baseline skill level requirements by trade department.
- Translate requirements into specific and measurable training objectives.
- Establish a program for measuring the impact of entry level training programs in terms of baseline skill level requirements.

Contributions:

- Improved control and assignment of entry-level trades personnel resulting from the creation of uniform entry level skills.
- Improved utilization of educational resources through better definition of a broader range of entry level requirements.

△ Area Industrial Engineering Support

- Assign to each major production area a specific Industrial Engineer to coordinate delivery of I.E. support and preparation of requests for support.
- Assist trade management in the development and coordination of area productivity improvement plans.

Contributions:

- Reduce demands upon trade manager to coordinate production support.
- Provide initiative for direct productivity improvement.

5.3.0 Contributions towards reducing cost overruns in production support areas

5.3.1.0 Required Outcomes

- Conduct a zero-base budget review of each production support area, function by function. ✓
- Redefine functions and responsibilities of production support areas so as to provide a baseline for a more objective assessment of their performance.

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Required Outcomes (Continued)

- Upgrade the Division's non-operations people cost control system. Provide consistency within the CTC, budget ledger and headcount budgets.
- Identify opportunities to achieve substantial cost reductions within production support areas by:
  1. simplifying the production planning process;
  2. reducing the manual component of reporting systems; and
  3. adopting a valid schedule baseline.

5.3.2.0 Specific Industrial Engineering Tasks

△ Materials Requirements Planning

- Establish a time-phased plan for the implementation of integrated materials management to include:
  - Materials Requirements Planning
  - Parts Numbering System
  - Inventory Control
  - Usage Controls
  - Materials Accounting
  - Automatic Requisitioning and Staging
  - Materials Handling Planning
  - Material Control Reporting
- Establish a baseline systems definition; identify loss functions; control points and codify operating decision rules.
- Establish overall requirements framework from design to inspection of finished item. Assess probable impact of design/specification changes on stability of material baseline.
- Establish process requirements of materials planning/sourcing/acquisition/control/disposition.
- Establish information/reporting requirements and performance objectives. Initiate data processing plan changes.
- Establish detailed implementation plan.

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Contributions:

- Reduction in Division inventory levels.
- More explicit and cost effective make/buy decisions.
- Reduction in Operations Department costs expended in working around material shortages.
- Reduction in the number of personnel supporting Procurement, Production Planning, Production Control and Material Control.
- More profitable cash flows.
- Reduction in materials handling costs.
- Increased manufacturing economics through the selected application of group classification and scheduling technologies.
- Reduction in capital requirements.

△ Manufacturing Planning

Review the Division's current approach and practices in connection with the planning of manufacturing work. Review production paper coding practices, methods employed for the assignment of work to production area, the application of production methods and production support requirements to work paper, the role of work paper as an accounting and material collection practice, etc. Review the process of developing B/M paper and its role in planning and controlling production in the manufacturing areas and its role in providing group available material.

- Determine the impact of physically distinct manufacturing locations upon the Division's traditional practices:
  - ✓ work assignment and scheduling
  - ✓ materials sourcing
  - ✓ control of manufacturing feeds
  - ✓ group staging requirements
  - ✓ change order planning and control
  - ✓ group technology
  - ✓ capacity monitoring
- ✓ Clarify the relationships between Groton and Quonset (also Avenel, Canadair).
- ✓ Devise more cost effective approach to the development of manufacturing paper.

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DYNAMICS CORPORATION.

Contributions:

- Reduced cost of "production support".
- Improved loading of manufacturing areas leading to more stable production and reduced cost.
- Improved cost/schedule control in manufacturing.
- Improved material availability leading to reduced installation costs.

△ Ship Construction Methods Engineering

Conduct a comprehensive review of Division activities responsible for the engineering and design of ship assembly techniques. These include, but are not limited to, Construction Engineering, Production Services, Production Engineering (Endloading), NC&E, Ship Assembly Engineering and Planning.

- Determine departments originating requests for services, schedules and events driving the support level of activities.
- Establish a production event construction schedule identifying requirements for engineered support.
- Identify established construction techniques and formulate necessary approval channels for departure requests from the established methods.

Contributions:

- Eliminate redundant methods, planning and engineering activities.
- Avoid conflicting schedules and priorities through elimination of parallel management.
- Consolidate technical support skills and needed expertise.
- Avoid conflict of work operations caused by incompatible tooling interfaces.
- Establish single point responsibility for cost and schedule performance for engineered moves required during ship assembly.

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△ Management Manual Improvement Program

- Consolidate Standard Practices.
- Reorganize Management Manual to align with Division major management decision areas.
- Integrate OC/FR Functional Responsibilities with Standard Practice activity requirements. Eliminate conflicts between "charter" (form) and action (substance).
- Integration of Standard Practice versus departmental instruction requirements.
- Establish criteria for procedures audit, surveillance and control program.
- Reduce level of resources required for SP maintenance and upkeep by 50%, thereby providing more resources for systems analysis and systems cost reduction efforts.

Contributions:

- Direct cost savings in Procedures group.
- Streamlined library of Division reference documents.
- Establish basis for extending uniformity throughout list of "verbatum compliance" documents.

5.4.0 Contributions towards reducing backlog of in-process material

5.4.1.0 Required Outcomes

- Identify, status entire in-process backlog. Define work remaining on backlog, estimate earliest completion dates based upon ideal mix of offload/in-plant facilities.
- Initiate offload programs as required to minimize in-process delays once material is available for work. Assure priority assignment of available resources to delinquent work.
- Upgrade existing production planning and control systems to assure adequate visibility is provided to potential future problems and to provide for more cost effective local scheduling and statusing procedures.

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5.4.2.0 Specific Industrial Engineering Tasks

△ Manufacturing Capacity Analysis

Establish and promulgate capacities for production areas at Groton, Quonset, Avenel, Canadair.

- Formally determine preferred capabilities.
- Determine currently assigned work profile over time.
- Determine most appropriate measure(s) of capacity for each area.
- Use measure to determine and state effective production capacities.
- Develop appropriate measures for reporting capacity utilization (current plan, current actual, forecast).

Contributions:

- Establish Division manufacturing capacity baseline.
- Upgrade basis for initial make/buy decisions and follow-up tracking.
- Provide Production Planning/Control with framework for more cost effective assignment of B/M work.
- Establish basis for possible integrated materials requirements planning.
- Provide Production Control with ceiling for area planning, manloading, offload.

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△ Machine Shop Production Control System

Establish upgraded production control system in the Machine Shop.

- Formally assess factors leading to recent excessive growth of backlog and work-in-process in the Machine Shop.
- Determine causes for low or improper utilization of current 3P system.
- Modify as required current production control system to:
  - update detailed schedule/dispatch priorities to reflect actual (as opposed to Master Schedule) conditions.
  - reduce necessity of physically staging in-process work on the floor.

  - calculate and distribute a comprehensive ECD listing.
  - provide visibility for work not physically within the shop (feeder material).
  - provide machine/work center schedules and forecasts for manloading.

- Establish an integrated production control program to include organizational statements of responsibility, operating procedures, interface with Operations, etc.

Contributions:

- Reduce in-process inventory levels on the floor leading directly to a reduction in throughput span times.
- Reduce the uncertainty involved with installation planning by providing higher confidence ECD's.
- Reduce costs of Machine Shop work through improved manpower/workload balance.
- Improved schedule control through earlier and more accurate identification of local, short-term overloads; more flexible and responsive offload.

Consumable Materials Control

- Establish a permanent management system for review and control of expenditures.
- Identify and implement improved budgeting, ordering and requirements planning policies and procedures.
- Increase management awareness and cost consciousness in the area of consumable materials.
- Provide the measurements and tracking mechanisms for the realization of $2 million cost reduction by the end of 1977.

Contributions:

- Direct cost reduction of $2 million.

Waterfront Space Utilization

- Conduct a detailed survey of the current utilization of all waterfront space (including floating facilities).
- Establish criteria for planning future utilization which makes appropriate cost/benefit tradeoffs among people needs, material storage needs, and production work area needs.

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Waterfront Space Utilization(Continued)

- Develop a detailed three-year plan for waterfront space utilization and upgrade.
- Integrate plan with 1977/1978 Capital Budgets.

Contributions:

- Permit the efficient staging of materials and support services in support of outfitting during 1978 (7 ships).
- Obtain economics in service material support of outfitting - consolidate storage and issue points - reduce costs.
- Establish a basis and initiative for the subsequent development of an "outfitting and test" area plan to coordinate delivery of software, consolidation of service requirements, reduction in trade planning support requirements, reduction in the cost of level-of-effort services.

△ Integrated Capital Budget

- Identify capital expenditures required in the production and production support areas which directly affect:
  - lower production costs
  - increased efficiency of material storage.
  - special property/tooling utilization and control.
- Establish engineering-based economic justification in support of cost reduction capital proposals.
- Establish a comprehensive and integrated capital expenditure plan for production/production support departments.

Contributions:

- Eliminate redundancy in the capital request/justification circuit.
- Reduce span time in development of capital plan.
- Upgrade impact of capital expenditures from year to year in terms of satisfying some positive, longer term objectives.

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5.5.0 Contributions towards reducing the cost of management systems

5.5.1.0 Required Outcomes

- Establish a Business System Control Board with overall responsibility for the Division's data processing planning and control.
- Establish a comprehensive and integrated plan for the expenditure of resources on business systems data processing.
- Establish formal procedures for the reporting and control of business systems data processing.
- On-going functional review of Division operating systems.
- Speedy corrections of 7000.2 validation deficiencies.

5.5.2.0 Specific Industrial Engineering Tasks

Data Processing Applications Review

Conduct a review of data processing utilization in all production and production support areas. Identify major data processing applications and their actual/potential impact upon the efficiency and effectiveness of key management decisions. Identify, by applications area, cost reductions to be implemented, needs not being addressed and consolidations which are desirable.

- Define a data systems baseline for the Division.
- Evaluate the magnitude and variability of "controllable" data processing expenditures.
- Consolidate data processing applications.
- Provide visibility to top management of data processing expenditures.
- Identify manager and responsibilities for data processing expenditures.
- Establish a Division Data Processing Plan and a mechanism for tracking and controlling ongoing and proposed data processing expenditures.

Contributions:

- Increased effectiveness in the expenditure of what amounts to an annual fixed charge for data processing services.
- Improved control over continuing expenditures for development efforts through:

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- specific assignments of responsibility.
- the existence (upon completion) of a plan for business systems data processing.
- a clear definition of the interface between the Division and DSS/EDSC.

△ DODI 7000.2 Implementation

- Simplify the Division's current approach to C/SCS implementation by:
  - reducing the complexity of the current systems design
  - integrating the criteria of DODI 7000.2 into the Division's basic control systems.
- Establish criteria and procedures for continuing systems audit, surveillance and maintenance.

Contributions:

- Provide a basis for a single facility-wide cost and schedule control system leading to:
  - reduced system costs
  - improved control.

△ Data Processing Paper Drive

- Review hard copy reports issued by DSS.
- Identify commonalities and possibilities for distribution to multiple users.
- Redefine user requirements and DSS distribution to eliminate reports.

Contributions:

- Eliminate duplicate and excessive computer output.
- Increase management awareness of data processing costs.
- Reduce overload of computer output requirements placed on the Eastern Data Center.
- Surface opportunities for sharing of data, consolidation of reports, reduction in frequency of computer printout orders.
- Direct cost savings.

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5.6.0 Contributions towards general I.E. objectives

5.6.1.0 Required Outcomes

- Define clearly routine requirements expected of Industrial Engineering in connection with:
    - performance reporting
    - tooling design, engineering and control
    - methods determination
    - capital plan development
    - systems analysis and design
    - 7000.2 support
    - general support activities
- Define management expectations in connection with the maintenance of an on-going level of effort devoted to general cost improvement activities.
- Define management expectations in connection with:
    - headcount reduction
    - personnel upgrade/improvement

5.6.2.0 Specific Industrial Engineering Tasks

△ Reallocation of Resources

- Reorganize for more efficient delivery of support.
- Reduce overall headcount.
- Establish criteria for upgrade of Management Systems function.
- Upgrade general skill levels by combination of headcount reduction and selective hiring.
- Establish formal project control system to assure competent delivery of productivity improvements and vigorous follow-up

Contributions:

- Establish a stable I.E. charter.
- Eliminate overlapping responsibilities.
- Establish a valid basis for measuring I.E. contributions to Division objectives.

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DIVISION COMMITMENT IMPLICATIONS

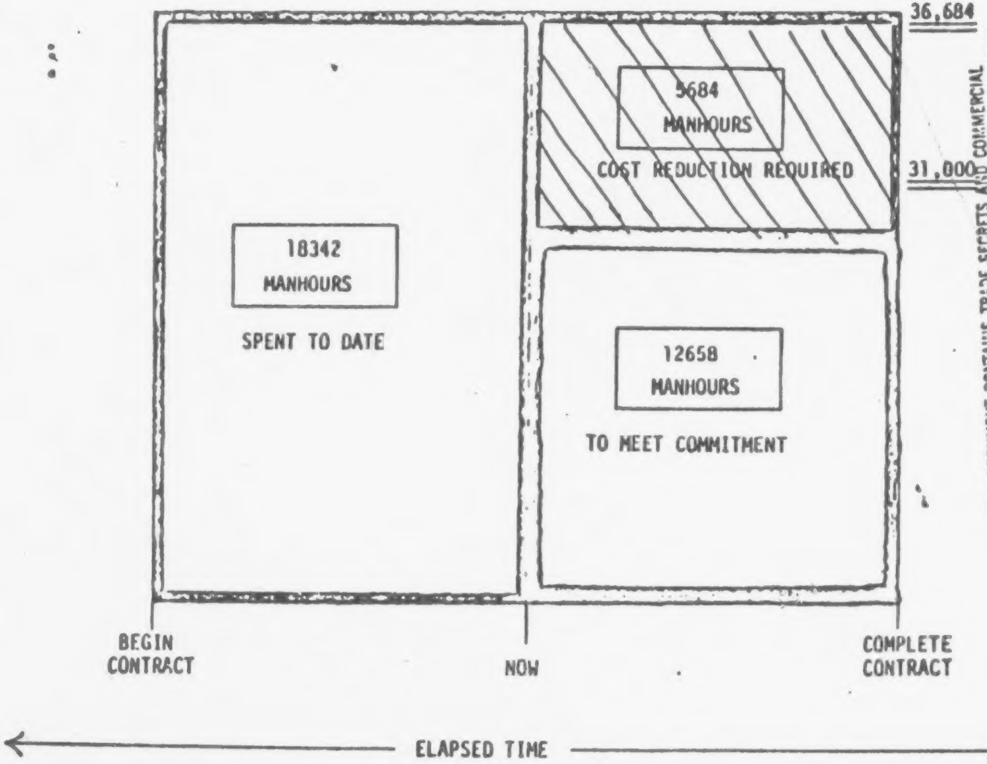
36,684
31,000
5684
MANHOURS
COST REDUCTION REQUIRED
18342
MANHOURS
SPENT TO DATE
12658
MANHOURS
TO MEET COMMITMENT
BEGIN
CONTRACT
NOW
COMPLETE
CONTRACT
ELAPSED TIME

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EXHIBIT 1

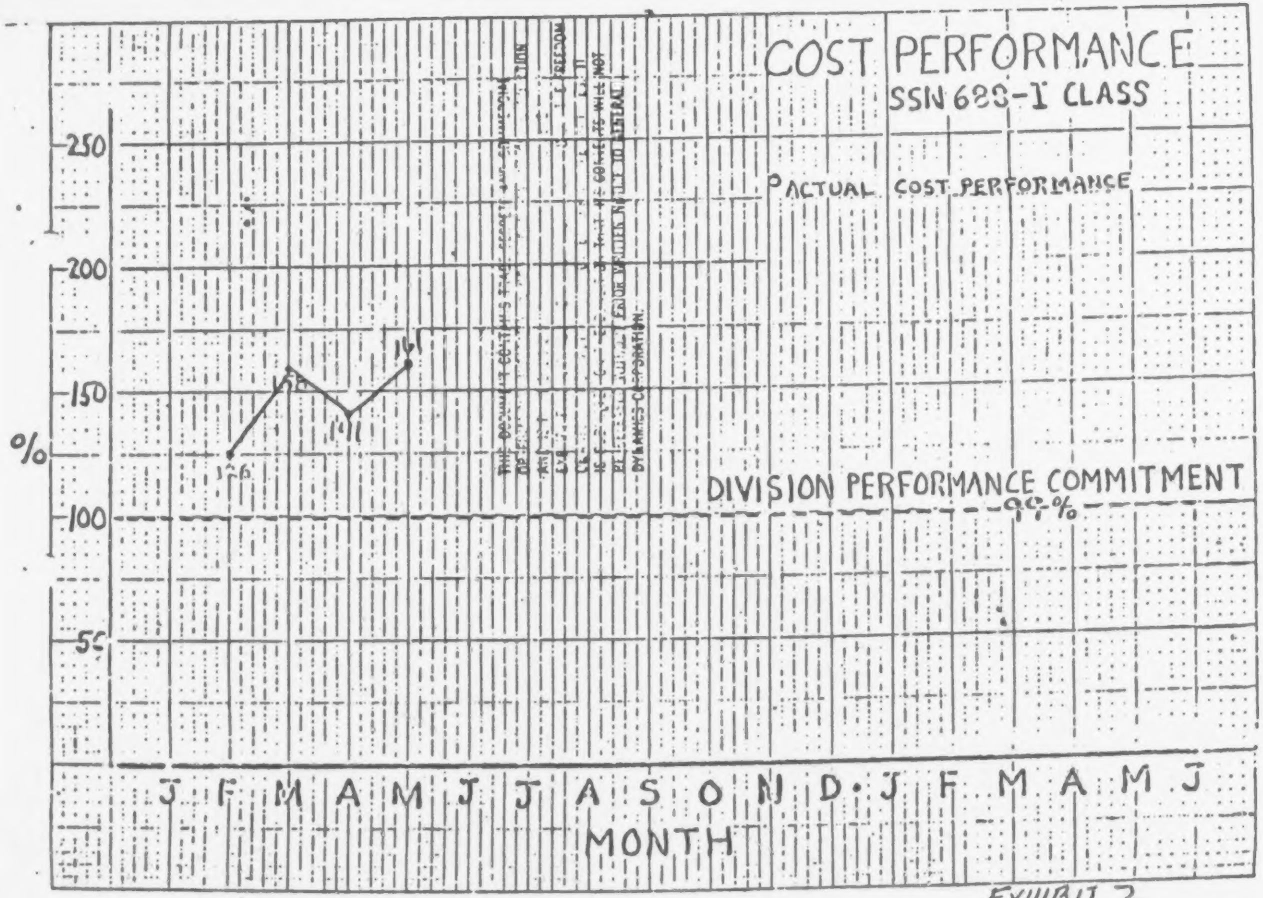
COST PERFORMANCE
SSN 688-I CLASS
ACTUAL COST PERFORMANCE
DIVISION PERFORMANCE COMMITMENT
99%
%
250
200
150
100
50
126
158
141
161
J F M A M J J A S O N D J F M A M J
MONTH
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EXHIBIT 2

SCHEDULE EFFECTS

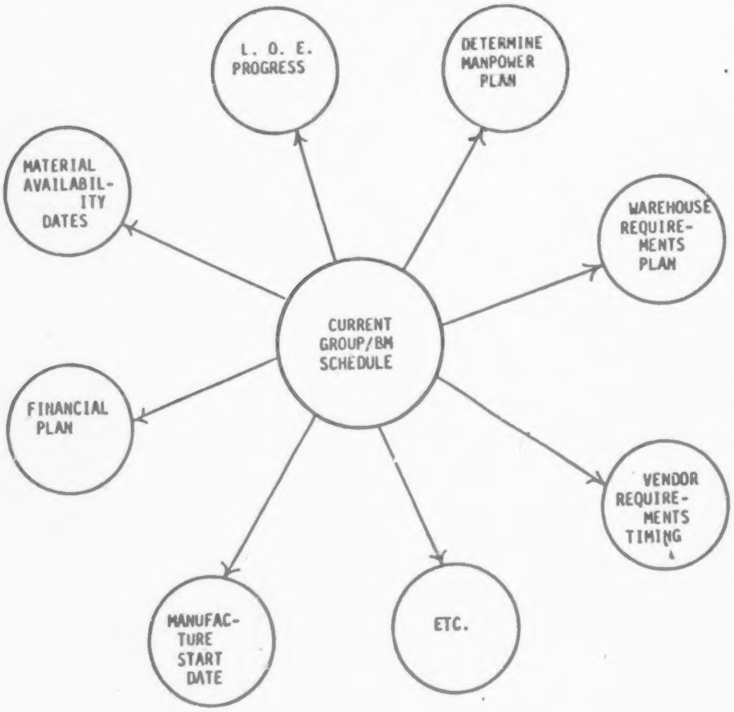
L. O. E. PROGRESS
DETERMINE MANPOWER PLAN
MATERIAL AVAILABIL-ITY DATES
WAREHOUSE REQUIRE-MENTS PLAN
CURRENT GROUP/BM SCHEDULE
FINANCIAL PLAN
VENDOR REQUIRE-MENTS TIMING
MANUFAC-TURE START DATE
ETC.

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EXHIBIT 4

6

CANADAIR
LIMITED MONTREAL

CONRAD KUNZE
GENERAL MANAGER-VALVE DIVISION

June 4, 1975

Dear David:

After much thought, I am writing you about the problems at Electric Boat. For more than two years I had been hearing of developing difficulties in the Shipyard. Until you sent the team back on April 28, with a second assignment, the difficulties seemed to be more rumor than fact. After a week of digging I was most shocked at the depth of the problem.

The organization recommendations the team made for Planning, Manufacturing Control and Industrial Engineering would help make Shipyard support more timely and effective, but the Electric Boat problems are more serious than indicated by our recommendations.

✓ The cost-to-complete forecast of Shipyard hours of 27,500,000 is understated. With present operation productivity a cost-to-complete of 34,500,000 hours appears more probable. Assuming the improvements to meet 34,500,000 hours for the seven ship program the cost curve will project a high hour situation into the eleven ship program where an overrun in excess of 10,000,000 hours is likely.

The approach being taken of slow, incremental improvements is, in my opinion, wrong. When performance is as bad as it now is major step improvements should be possible. The direct labour budgets can be met and courses of required actions necessary for bringing the Shipyard to budget immediately should be instituted.

RECEIVED
JUN 10 1975
OFFICE OF
THE CHAIRMAN

In outlining a course of action for major improvements in Shipyard costs, an analysis of present management shortcomings, and how they came about, is necessary.

Early in 1973 a major shift in management technique was introduced. There were diverse reasons for the moves that were made. In planning (1971-1972) for the expected heavy work load three major points were developed:

> One, that, of the Shipyard management then in being, most of the managers would be retiring about half-way through the Trident program. Thought was given to the possibility of putting new managers into place prior at the start of the Trident program.
>
> Two, that certain of the Shipyard managers, O'Neil, Britagna, Impellitteri, were adverse to changing their management style to that of a planned, controlled operation.
>
> Three, that the projected work load of 688 Class, Overhaul and Trident would overload the most competent trade manager and that a solution to this projected difficulty could be management by product line.

In March 1973, product line management was introduced, trade managers were set aside, and young managers who could be expected to have a work career throughout the life of the Trident program, and who could also be expected to accept new planning and control concepts, were placed in charge of the Shipyard.

While the goals of the product line management concept were laudable, insufficient analysis was made of what was being lost and methods of providing for the losses were not developed.

When the trade managers, O'Neil, Britagna, Pia, Impellitteri, Bauer and Jones were set aside, Shipyard operations lost three things:-

1. Trade know-how. Planning at Electric Boat is "what to do" with the craft trades providing the "how-to" capability. The best "how-to" capability was set aside.

2. Fairly competent management. Some of the trade managers were mediocre managers of people, but several were quite competent.

3. Problem solving skill. All of the set aside managers were experts at building submarines and resolving difficulties as they arose. This skill was completely set aside with no replacement.

The product line managers appointed in March 1973 have, with one exception, since been replaced and several of the replacements have been replaced. The management skill in the Shipyard is probably of a lesser quality today than the management that existed prior to the change to the product line concept.

✓ Two major problems now exist at Electric Boat: ineffective management in Operations and the Shipyard, and unsatisfactory manpower and cost control techniques.

Proposing an effective solution to the manpower and cost control problem requires recognition of the type of work involved in a Shipyard. Submarines are constructed not assembled, and aircraft assembly line techniques are generally not applicable. This is the main reason why, after two years of work and application, crew-loading has been and is proving, ineffective Shipyard crews, by crew-load definition, do not exist.

Although Electric Boat now has 18 submarines of the 688 Class to build and low-cost production techniques can be introduced in such a long run, assembly line concepts are not usable; as an example of the problems, the hull erection plans for the first seven submarines are all different. Low cost production methods and manpower control techniques must be based on the facts of ship construction. 70% of all Shipyard work can be categorized as one man jobs and Shipyard work can be done on a low-cost basis if the kind of work to be done and the control problems are recognized and provided for.

Between 1967 and 1969, first at Electric Boat and then at Quincy, I was responsible for developing effective Shipyard manpower control techniques. Essentially, we developed small (less than 80 hours) work packages, based on BM's and Groups, that provided the first line supervisor with a tool for work assignment to, and performance measurement of, the individual worker. Because the work span-time was relatively short, two weeks or less, close control of work performance with resultant corrective action of indicated poor performance resulted in a major cost turnaround at Quincy. The attached chart, produced by the Quincy comptroller, shows the remarkable improvement in performance achieved in 1969. Unfortunately, Bergeson was named general manager in October 1969, and he immediately junked the program with adverse results.

Installation of a similar cost control program at Electric Boat could, with effective management, result in a rapid, major improvement in cost performance.

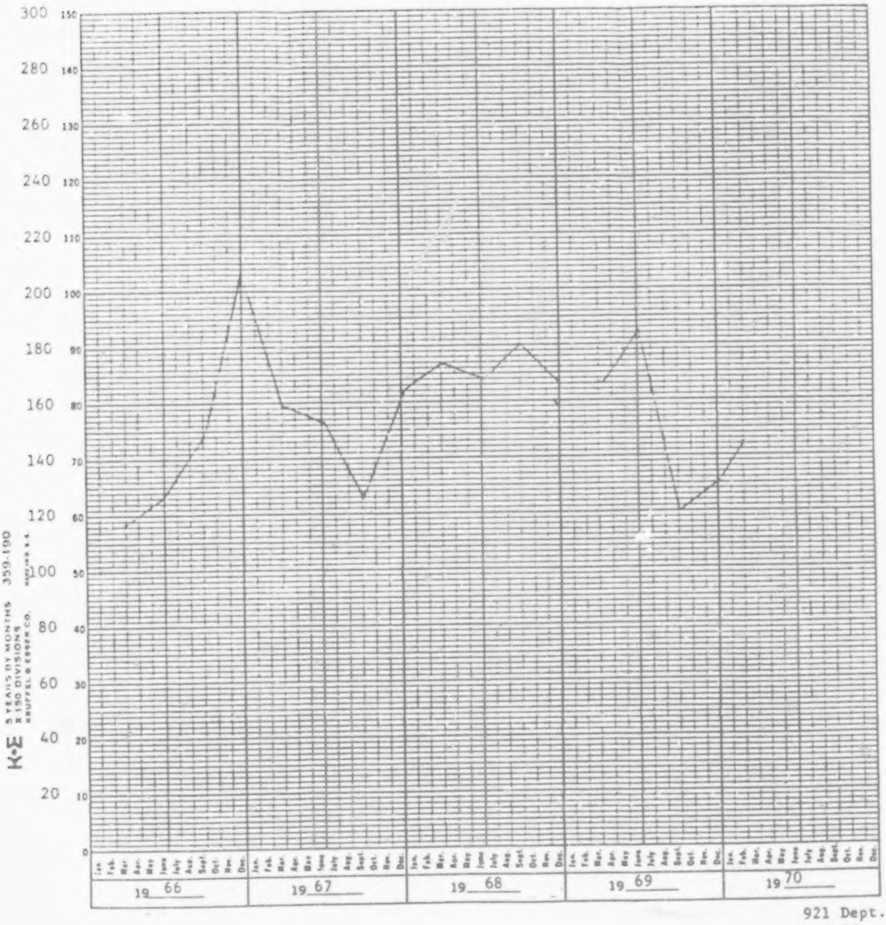
The talent to organize and manage a low-cost Shipyard operation exists at Electric Boat or in other General Dynamics Divisions. Use of this talent with a proven cost control system could make Electric Boat the profitable Division you have a right to expect it to be.

Sincerely,

David S. Lewis,
Chairman, President and Chief
Executive Officer,
General Dynamics,
Pierre Laclede Centre,
St. Louis, Mo.
63105

QUARTERLY
INCREMENTAL PERFORMANCE

TOTAL YARD ALL SHIPS LESS
AS-36



921 Dept.
9-4-70

⑦

GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: Mr. P. T. Veliotis

Date November 23, 1977

FROM: T. S. Wadlow

FILE NO.:

SUBJECT: 1) Shipyard Current Performance CTCs
2) Assumption to Meet 688-I Forecast CTC
REFERENCE: 3) Summary of Cost Engineering Forecasts

At your request I have, with the assistance of Bob Januska, prepared a current performance CTC for the shipyard. The results are:

	(Manhours 000)
688-I	43,436
688-II	60,112

Also attached to this memo are the list of assumptions to meet the 42.4 million manhour estimate on 688-I, and a chronological summary of Cost Engineering forecasts on 688-I and II. It should be noted that farmout differences have not been corrected for and therefore the growth is in fact somewhat more than the number indicated.

T. S. Wadlow
T. S. Wadlow

November 23, 1977

The following items are assumptions or requirements to meet the 42.4 million manhour estimate for 688-I shipyard trades:

- Stop workforce buildup thereby allowing the skill mix to improve.
- Take necessary disciplinary/administrative action to begin to reduce absenteeism.
- Make a major reduction in the number of plan changes that are going to the shipyard.

In order to continue to improve, as forecast through the second flight, other actions required would include:

- Reduce unnecessary work such as:
  - Poor fit ups that require extra weld deposit.
  - Oversized fillet welds (not required by spec).
  - Grinding to smoother finish than required.
- Assure that same method is followed on repeat work, unless a clear benefit results from a change.
- Work to real schedules (proper sequence, etc.).
- Get automatic welding equipment used when it should be.
- Complete work on fabrication before it gets installed.
- Reduce the amount of material which is not available when needed.

November 23, 1977

Cost Engineering

Summary of Cost Engineering Forecast
(Manhours in Millions)

		688-I			688-II		
		Shipyard	Support	Total	Shipyard	Support	Total
	Contract - (June '71 - 688-I (Nov. '73 - 688-II)	22.2	4.9	27.1	32.2	8.4	40.6
	Estimate - (Nov. '73 - 688-II)				40.4	8.4	48.8
	Review with D. S. Lewis (2/1/74)	28.7	-	-	-	-	-
	Study for Pierce and Curtis (8/9/74)						
	Estimate	28.0	6.1	34.0	38.8	8.6	47.4
	Risk Estimate	33.6	8.1	41.7	48.8	13.1	61.9
	Review with D. S. Lewis (11/19/74)						
	Estimate	32.5	-	-	-	-	-
	Risk Estimate	-	-	47.6	-	-	66.6
	Review with D. S. Lewis (1/6/75)	35.2	7.9	43.1	45.4	9.6	55.0
	Cost Engineering Review (7/3/75)						
3 I	Optimistic	36.5	10.3	46.8	45.9	12.3	58.2
	Current	38.9	10.9	49.8	48.9	13.0	61.9
	Cost Engineering Study (5/17/77)						
II	Best Possbile	39.4	11.6	51.0	41.6	12.8	54.4
	Most Probable	41.6	12.8	54.4	49.1	13.5	62.6
III	Cost Engineering Study Possible (6/7/77)	40.7	13.0	53.7	44.8	14.0	58.8
	Cost Engineering Estimate (11/17/77)	42.4	13.1	55.5	50.3	12.4	62.7

I

GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: Mr. A. M. Barton

Date July 3, 1975

FROM: T. S. Wadlow

FILE NO.:

SUBJECT: 688-I and II Costs

REFERENCE:

Enclosure: (1) Summary
(2) Manhour Forecast
(3) Schedule Analysis
(4) Rate Calculation

Cost Engineering has recently updated its projection of costs on the 688-I and 688-II contract. Revenues, exclusive of the REA, were also forecasted so that a net loss could be calculated. While a relatively gross basis was used for adjusting these rates, Cost Engineering feels that the projections are nonetheless accurate within normal estimating error. Included in this update are the results of the Cost Engineering/Industrial Engineering "scope" review. Also included are the results of a review of the functional area manhours which makes them consistent with the 688-III bid.

Two forecasts have been made. The first is the updated Cost Engineering estimate. The current performance on the ships indicates that this set of numbers is somewhat optimistic, though certainly still potentially achievable. The second set of numbers (labeled "b") is more consistent with the Industrial Engineering forecast and, while recognizing substantial improvements in the future, starts from cost levels based on current performance trends.

Attached are four enclosures. The first contains the summary and pricing, the second shows the manhours forecast, the third summarizes the schedule analysis, and the fourth shows the rate derivation.

T. S. Wadlow
T. S. Wadlow

TSW:pk

Enclosure (1)

688-I and II Analysis Summary

	688-I		688-II		688-I and 688-II	
	a	b	a	b	a	b
Shipyard Manhours (000)	36,489	38,889	45,891	48,891		
Other Manhours (000)	10,270	10,930	12,315	13,040		
Total Manhours (000)	46,759	49,819	58,206	61,931		
Spent Manhours (000)	15,998	15,998	322	322		
To Go Manhours (000)	30,797	33,821	57,884	61,609		
Rate on Spent Manhours	$10.79	$10.79	$13.45	$13.45		
Spent Labor Dollars (millions)	172	172	4	4		
Rate on To Go Manhours	$14.82	$15.56	$18.07	$21.14		
To Go Dollars (millions)	$ 456	$ 526	$1,046	$1,302		
Material CAC (millions)	$ 212	$ 217	$ 471	$ 493		
Total Cost (millions)	$ 840	$ 915	$1,521	$1,799		
Revenue: Current Forecast (millions)	$ 523	$ 523	$1,224	$1,224		
Additional Changes (millions)	$ 7	$ 7	$ 20	$ 20		
Total (millions)	$ 530	$ 530	$1,244	$1,244		
(Loss) ($millions)	$ (310)	$ (385)	$ (277)	$ (555)	$(587)	$(940)

Explanatory Notes

Negotiated Reduction

For pricing purposes only - no reason on either of these contracts to think estimate was high.

Estimate Reduction

(688-II) approximately 100,000 hours/ship cut by E.B. General Manager before St. Louis review - 500,000 hours/ship cut by St. Louis in two cuts of 300,000 and 200,000 hours.

Scope

What the estimate would have been if the estimator had known what he knows now about the ship and its design. Much of this has been claimed as defective design on the 688s.

Schedule

The labor and material costs of longer schedules. Does not include economics of higher rates or more expensive material price levels. Does include current service cost levels in labor. Also includes more lost material, etc.

Other

Includes performance, disruption, low estimate.

Escalation

Includes price level increases in material - not limited to index growth rate. In labor it includes all rate growth - both due to schedule slips and rate changes.

Farmout

Current estimate. Based on no net impact to support hours.

Total Cost

Assumes current schedules (Claim schedule on 688-II).

Enclosure (3)

Schedule Analysis

	a	b
690 Delivery	May 1976	June 1976
Intervals	692 - 6 months 694 - 6 months Then 4 months	692 - 6 months 694 - 6 months Then 5 months for 10 ships Then 4 months
Delivery of 710	May 1982	April 1983
Slip of 710	15 months	26 months

Note:

1. Neither "a"nor "b" have any strike contingency.
2. "b" reflects what is felt to be the impact which TRIDENT will have on the overall production capability. "a" ignores TRIDENT but assumes a production rate of greater than three ships/year unlikely considering the size and complexity of the ships.

Enclosure ([illegible])

Rate Calculation

The rates are based on the First Quarter 1975 CTC rates of \$14.11 for 688-I To Go manhours and \$16.13 for 688-II To Go manhours with the following adjustments:

688-I

For alt "a"

Estimate a six month slip in the midpoint because of schedule slips and the fact that the later ships will have the majority of the added manhours. Use a 10% total rate escalation rate, since most of the shifted manhours will not cross the first year of an MTC contract.

Therefore the rate is:

\$14.11 X 1.05 = \$14.82

For alt "b"

Add three months more shift to the midpoint due to more schedule shift and add five points to the overhead to be consistent with the less optimistic manhours.

Therefore the rate is:

\$14.82 X 1.05 = \$15.56

688-II

For alt "a"

Estimate a one year average slip in the midpoint. Use a 12% annual total rate escalation rate, since most manhours will cross the first year of a MTC contract.

Therefore the rate is:

\$16.13 X 1.12 = \$18.07

For alt "b"

Estimate a two year average slip in the midpoint. Also add 10 points to the overhead to be consistent with the less optimistic manhours.

Therefore the rate is:

\$18.07 X 1.17 = \$21.14

Methodology

5/17/85

II

6 I "Best Possible"

Trades – Based on improvements over previous 5 mos. average actual % progress (sea-fer) of the following magnitudes.

692 & 694 – @ 100% improvement
696 → 25% improvement
697, 98, & 99 50% improvement
700 → 15% improvement

The 690 was based on Turks @ 75% of its March weekly load (sort time).

PSA was added @ 50K on the 690 & 30K on 692 → 700.

The other boats, ssn 701 → 710 were brought in to the FCEY = at 3822 utilizing a 92% curve with the 700 being the 4th ship on the curve (assumes 3 ships preceded any learning)

Support – Faired in to 684 support level of 20% by ssn 701 → 710. 690 is as submitted CAC, 692 – 25% 694 – 24% 696 – CAC less 10% 697 – 23% 698 – 22% 699 – 21% 700 = CAC less 20% on large portion of CAC

II "Most Probable"

Trades – improvements @ 50% of "best possible" except 15% on 696 & none on 700 –
PSA @ same levels as "best possible"
700 brought to Cost Engineering 688 I ≠ of 3926 + 200 for G.L. = 4126 utilizing 91% C & 700 @ 4th boat

Support – at 25% except 690 as submitted CAC, 696 = CAC – 10%, 700 = 50%

Boat	January '77 Estimate Trade	Support	Total		Prelim. [illegible] Trade	[illegible]	[illegible]
688I							
SSN [illegible]	6997	3993	10900		[illegible]	4053	[illegible]
692	5867	1410	7277		[illegible]	[illegible]	[illegible]
694	5428	1031	6659		[illegible]	1385	7059
[illegible]	4843	1155	[illegible]		[illegible]	[illegible]	[illegible]
[illegible]	4525	[illegible]	[illegible]	4556	[illegible]	[illegible]	[illegible]
[illegible]	4363	1005	5368		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]
Total 688 I	36307	10352	[illegible]		37003	[illegible]	[illegible]
688I							
SSN [illegible]	4027	1925	5952		[illegible]	[illegible]	[illegible]
[illegible]	3964	922	4886		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible]	3759	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
706	3759	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
707	3730	842	[illegible]		[illegible]	[illegible]	[illegible]
708	3705	840	[illegible]		[illegible]	[illegible]	[illegible]
709	3691	834	[illegible]		3986	906	[illegible]
710	3705	833	4538	[illegible]	[illegible]	[illegible]	[illegible]
Total 688I	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
Total 688 Class	78206	21367	[illegible]		79650	[illegible]	[illegible]

"Best Possible" Trade	Export	Total Hours	"[illegible]" [illegible]	[illegible]	[illegible]
7196	4053	11249	7196	4053	[illegible]
6370	1578	[illegible]	[illegible]	1648	[illegible]
6042	1412	7534	6300	1594	[illegible]
[illegible]	1200	6550	[illegible]	1552	[illegible]
4703	1098	5801	[illegible]	1298	6457
4855	[illegible]	[illegible]	[illegible]	1384	[illegible]
4803	1009	5810	5395	1350	[illegible]
29202	11586	50965	4,592	[illegible]	[illegible]
[illegible]	2013	6452	4936	2465	[illegible]
4322	864	5186	4036	1190	[illegible]
[illegible]	846	5054	4651	[illegible]	[illegible]
4150	830	4980	4504	1144	[illegible]
4084	817	4901	4492	1123	[illegible]
4026	805	4831	4420	1105	5525
[illegible]	795	[illegible]	4350	1089	[illegible]
3920	750	[illegible]	4301	1075	[illegible]
3855	776	4637	4251	1063	5314
3852	771	4623	4205	1051	5256
3822	764	4586	4126	1030	5156
[illegible]	10069	[illegible]	[illegible]	12515	[illegible]
[illegible]	[illegible]	95754	30012	26363	17050

Given to McDonnell by Barton

June 7, 1977

111

688-I and II
(000)

688-I

	December Forecast	2nd Quarter CTC	Possible	△ to CTC	△ to Possible
Manhours					
Trades	36,307	37,003	40,700		
Others	10,752	11,910	13,000		
Total	47,059	48,913	53,700		
Labor $	619	647	719		
Material $	225	231	241		
Schedule △	-	2	5		
Rates	-	-	7		
Total	844	880	972	36	128

688-II

	December Forecast	2nd Quarter CTC	Possible	△ to CTC	△ to Possible
Manhours					
Trades	41,899	42,847	44,800		
Others	10,615	12,472	14,000		
Total	52,514	55,319	58,800		
Labor $	858	906	965		
Material $	531	531	550		
Schedule △	-	-	50		
Rates	-	-	8		
Total	1,389	1,437	1,573	48	184
Total 688-I and II				84	312

SSN688 PROGRAM STATUS

($000's)

SSN688 I 1977 Plan Cost toComplete	$ 843,690
SSN688 II 1977 Plan Cost to Complete	1,389,429
Total Cost	$2,233,119
Estimated Revenue	1,858,787
Loss Before REA	$ (374,332)
Increase in Cost to Complete	
Foley (including IE and Maintenance)	$ 9,127
Nardone	24,733*
Hunter	8,231
DeMartino	7,023
Victor	1,310
Herndon	14,851
Mavro	5,917
Kelley	4,314
Other (including material)	3,968
Total Increase	$ 79,474
New Loss Before REA	$ (453,806)

*Includes $17,000 for Quonset Machine Shop/Shipyard.

GEM - do more thinking about it - no BS - must do something about it.

Reconvene June 21st 8·30 AM

GENERAL DYNAMICS
lectric Boat Division
Eastern Point Road, Groton, Connecticut 06340 • 203 446-5960

File per date in [illegible] ⑧
Rd Cn [illegible]

Gen/14 February 2, 1973

114.170

Subject Productivity

Reference
(a) SupShip letter, Ser: 710-7, dated January 8, 1973
(b) SupShip letter, Ser: 713-26, dated January 17, 1973
(c) SupShip letter. Ser: 710-39, dated January 25, 1973
(d) SupShip letter, Ser: 100-26, dated January 23, 1973
(e) EBDiv letter dated January 22, 1973
(f) SupShip letter, Ser: 100-30, dated January 25, 1973

Supervisor of Shipbuilding
Conversion and Repair, USN
Groton, Connecticut

Attention: Captain P. G. O'Keefe

Sir:

1. References (a), (b) and (c) expressed the Supervisor's concern at the apparent amount of non-productive, idle time existing in the shipyard together with the results of his observations in several shops and ships in support of that thesis. Reference (d) observed that there was a consistent lack of aggressive management attention to reduce idle time and concluded that as a result thereof, the Contractor should be penalized in the determination of profit and fee for change order work and on proposals for overhaul/conversion, repair and new construction contracts in accordance with weighted guidelines calculations for the "below the line" input.

2. Reference (e) advised the Supervisor that the Contractor's actions in this regard would be transmitted to the Supervisor by February 2, 1973.

3. To put this whole subject in perspective, it should be recognized that the Contractor has been directing its attention to the subject of productivity for some time and has taken specific actions to improve its performance. The following actions have been undertaken:

a. The WOFAC program was initiated in November of 1970 and has been carried on by our expanded Industrial Engineering Department. Coverage of the Operations Department work force is expected to be essentially complete by the end of the third quarter of 1973. As a result of productivity improvements achieved through this program, the Contractor was enabled to reduce its proposed shipyard hours for overhaul of SSN636, SSBN616 and SSN607 by over ten percent.

RECEIVED
FEB 5 1973
H. W. PAIGE

- -

b. A team of three management personnel under the supervision of Mr. N. S. Hill, former Project 740 Program Manager, has been assigned to make continuous idle time observations throughout the shipyard, verify that apparent idle time is, in fact, loafing or standing, insure that first line supervision is correcting the problem and identifying the causes therefor. Where the reason for idle time is beyond the control of the worker and his supervisor, such as waiting for a support trade or material, the supervisor will be instructed by this team in the most expeditious method of escalating the problem to get relief. Finally, this team will identify those supervisors requiring additional coaching or change in assignment.

c. A revised supervisory training program has been established by Operations and Industrial Relations on the basis that the control of non-productive time is primarily the responsibility of the first line supervisor. This new course which started on January 2, 1973 will ultimately be given to all supervisors in the shipyard. The curriculum which is still undergoing some refinement in content will last 40 hours and, to date, 32 new supervisors have completed the course. Emphasis is being placed on the basic skills required to be a good supervisor with specific attention being paid to controlling idle time and improving productivity. A new shipyard supervisory selection and training coordinator has been assigned full time, reporting to the Operations Director to aggressively progress the effective and total implementation of our supervisory selection and training program.

d. We have established a schedule, with targeted completion of May 31, 1973, to evaluate and formally establish the scope of responsibility and support for the major shipyard positions of Ship Manager, Ship Superintendent, first line Foreman, General Foreman, and Account Manager (for implementation on contracts invoking DOD Instruction 7000.2). These scopes will identify the salient parts of each job, identify the amount and type of support to be provided by other functions and will provide a means of measuring whether incumbents are making most effective use of their time. This will also improve the selection process described in c above.

GENERAL DYNAMICS
Electric Boat Division

e. Break time for workers has been more clearly defined to all Staff Managers and the rules and regulations governing this area including instructions for implementation have been communicated to all supervision.

f. A work simplification work methods improvement team of four Industrial Engineers started that phase of our productivity effort in the sheetmetal shop in November. Further areas are under investigation and will be entered as resources permit.

g. Industrial Engineering functions were consolidated in December, 1972, to synthesize the activities of Work Measurement Control, Work Methods Improvement, Production Engineering, Welding and Materials Engineering and Direct Labor Control.

4. On January 29, 1973, Mr. M. C. Curtis was assigned as Deputy General Manager at Electric Boat with a primary assignment to improve productivity. This [illegible]tion will consolidate all production and related activities in the yard under one experienced manager. Mr. Curtis was General Manager of the San Diego operation of the Convair Aerospace Division of General Dynamics and brings to his new position a long history of successfully solving production problems at the Canadair, Fort Worth and Convair Divisions.

5. Electric Boat regards the above response as representing a meaningful statement of actions underway to satisfy both the Navy's and our own interest in improved productivity and this letter therefore constitutes a proper response to references (a), (b), (c), (d) and (f). Mr. Curtis will keep you advised of progress on a regular basis. In view of Electric Boat's overall performance in timely meeting the Navy's requirements for construction and overhaul of submarines, and in view of the intensive effort we have been making and will continue to make to improve productivity, we do not believe it appropriate for the Supervisor to take the action in respect to profit fee stated in paragraph 4 of reference (d).

Very truly yours,

GENERAL DYNAMICS
Electric Boat Division

J. D. Pierce
General Manager

cc: NavShips (Ships 02)

Distribution attached

Distribution:

A. M. Barton
T. S. Cramer
M. L. Curland
M. C. Curtis
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Main File

SUPERVISOR OF SHIPBUILDING,
CONVERSION AND REPAIR, USN
GROTON, CONNECTICUT 06340

~~101~~
114.202

Code 710:JMR:ndl
4350
Ser: 710-39
25 January 1973

From: Supervisor of Shipbuilding, Conversion and Repair, USN, Groton
To: General Dynamics Corporation, Electric Boat Division, Groton
(Mr. J. D. Pierce, General Manager)

Subj: Control of Nonproductive Time

Ref: (a) SUPSHIP GROTON ltr Ser: 710-7 of 8 Jan 73
(b) SUPSHIP GROTON ltr Ser: 713-26 of 17 Jan 73
(c) EBDIV ltr of 22 Jan 73 same subject

1. The purpose of this letter is to forward additional observations relative to the problem of shipyard idle time.

2. References (a) and (b) expressed my concern over the problem of idleness in the shipyard. Reference (b) stated that systematic observations have been made to define types of idle time and discussed the issue of break early idle time in particular. Continuing observations have shown a serious "standing" problem. As used here, the work "standing" is meant to be the observation of a worker at a work site (e.g., onboard ships or in production shops) but not engaged in actual work. These standing observations were all made at times during normal working hours other than the first and last half hour of the shift and the half hour before and after the lunch break.

3. The results of these observations indicate that 41.5% of the shipyard work force are in a condition of standing idle; shipboard observations alone indicate a standing idle rate of 47.5%. These figures are based upon the cumulative observations of 1667 workers at various work sites and 710 workers at shipboard work sites.

4. Some illustrative examples of this standing idle portion of the overall idle time problem are provided below. They are a cross section of incidents observed during a recent two week period.

a. SSN571 1915: Two of nine workers observed working; the others were talking and drinking coffee. Four of the seven were inside shelters - all seven left the area immediately upon noting the observer.

b. SSBN616 1000: One man in sail resting, four men idle in LL AMR #1, two men idle in LL AMR #2, five men idle in LL OPS compartment. Eight men were loafing around the partitioned-off area of Reactor Compartment (MBT-5 in basin).

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c.	Plate Shop	1005:	Fourteen of twenty-eight workers idle. Returned to plate shop ten minutes later and found approximately the same per cent (and individuals) standing around.
d.	North Yard Fabricating and Assembly Area	1010:	Approximately ten people were observed standing idle in this area.
e.	UT Test Lab	1030:	Nine men observed in lab. Five standing and four sitting; all appeared to be loafing. Same condition existed five minutes later.
f.	Clean Room Area 6P	1045:	Eight of fourteen first observed idle. One man had eyes closed sitting in front of a non-operating machine on the south side of building. Most men returned to work when observer was noted.
g.	SSN690	1030:	Eight men were observed on bottom of ways, standing around for at least ten minutes.
h.	SSN607	1450:	Thirty-six of forty-three men observed were not working. Sixteen of eighteen in the engine room were idle.
i.	SSN607	1500:	Sonar Control Space - three workers observed - none working. Five minutes later five of five not working.
			Nine man bunkroom - Four workers observed, all idle and talking.
			Engine Room - Eighteen workers observed, sixteen idle sitting or standing in small groups.
j.	SSN685	1420:	Observed six out of six workers idle in the heated enclosure in the forward portion of the building ways.
			UL Reactor Compartment - Observed four men idle talking about "coon hunting."

Code 710:JMR:ndl
4350
Ser: 710-39

Subj: Control of Nonproductive Time

k. SSN638 2000: Topside Area - Three workers standing idle under a canvas enclosure. Five standing at the brow talking.

5. In reference (c) you indicated that by 2 February 1973 Electric Boat Division will respond to the Supervisor's requests for immediate corrective actions to control nonproductive time. In that the overall problem of idle time includes the issue addressed in this letter, it is expected that the reduction of standing idle time will be addressed in your 2 February response.

P. G. O'KEEFE

Copy to: ✓
Codes: 100, 101, 700, 710, 711, 712, 713, 161

Recent Examples of Abuses of Productive Time at Electric Boat

114.152

These are but a few typical examples of a large number observed in the past two months. These examples should not be construed as comprising a complete listing of instances of poor productivity. They serve only to illustrate the unsatisfactory situation concerning idleness, loafing and inefficiency in the yard as determined randomly. The situation has been and continues to be endemic at Electric Boat.

Note: The examples in paragraphs A. through H. below all occurred during shift working hours - not during lunch breaks or between shifts.

A. Lack of Action by Supervisors Present

1. On March 8, 1973, second shift, 30 tradesmen and 5 supervisors were aboard USS WHALE (SSN638). Ten were idle. One man was looking at magazine pictures in a ship's office. One man leaning against a rail started talking about the weather in Connecticut. Two idle men were watching a third man working near the engine room work bench. Three men were in the lower level operations compartment smoking and joking. Two men were in the upper level operations compartment smoking and talking. One man was just standing in the auxiliary machinery room with a rag in his hand. None of the 5 supervisors present took action to get the idle workers back to work.

2. On March 9, 1973, first shift, 10 of 13 workers in the Building 130 Electronics Shop were idle. A supervisor was present but took no action with the idle workers.

3. On March 10, 1973, first shift, 7 of 16 men at Wet Dock D and E preparing for the arrival of USS GEORGE BANCROFT (SSBN643) were idle. Six supervisors were present in the area but took no action to get the idle men to work.

4. On March 13, 1973, first shift, 7 of 17 workers in the mockup building were idle drinking coffee, eating or engaged in idle conversation. Three supervisors were present but took no action with the idle workers.

5. On March 15, 1973, first shift, 56 of 83 workers at the North Yard Building Ways were idle - many were taking a coffee break. A supervisor present took no action with the idle workers.

6. On March 17, 1973, second shift, 3 of 4 men in the engine room of WHALE were idle for an hour. A supervisor was in the area frequently but took no action to get the idle men to work.

7. On March 21, 1973, first shift, 20 of 46 workers aboard USS NAUTILUS (SSN571) were idle. Five supervisors were aboard the ship but took no action with the idle workers.

8. On March 22, 1973, first shift, 8 of 13 workers in the Maintenance Machine Shop were drinking coffee and eating. Two supervisors were seated at desks in the shop. The supervisors took no action with the idle workers.

9. On March 24, 1973, first shift, 9 of 11 workers topside on USS GEORGE WASHINGTON CARVER (SSBN656) were idle. Two supervisors present took no action to get the idle men to work.

10. On March 26, 1973, first shift, 21 of 30 workers in the mid ship compartment of GLENARD P. LIPSCOMB (SSN685) were idle. Two supervisors were in the compartment but took no action to eliminate the idleness.

11. On March 26, 1973, first shift, 2 supervisors were leaning against a work bench in the Graving Dock Pipe Shop talking while 26 of 34 workers in the shop were eating, drinking coffee or otherwise idle.

12. On March 29, 1973, first shift, one supervisor was in the chief petty officer quarters aboard USS LAFAYETTE (SSBN616) reading a newspaper while another supervisor and 6 workers were loitering in the area.

B. Arriving After Shift Begins, Quitting Work Early and Returning Late from Lunch

1. On March 22, 1973, first shift, in one compartment of WHALE 12 men had stopped work and started gathering around the ladder to leave for lunch 10 minutes before the start of the lunch period. Another 17 joined them 5 minutes before the start of lunch period. Several supervisors were in the area but took no action to prevent stopping work early.

2. On March 28, 1973, first shift, 20 of 27 men in the lower level missile compartment of LAFAYETTE, including two supervisors, had stopped work and were waiting for lunch 7 minutes before the start of the lunch period.

3. On March 28, 1973, first shift, 28 workers and two supervisors returned to NAUTILUS five to eighteen minutes after the end of the lunch period.

4. On March 28, 1973, at the beginning of the second shift in the graving dock area, 101 tradesmen and 6 supervisors arrived 10 to 20 minutes after the shift began and 75 tradesmen and 7 supervisors arrived 20-30 minutes after the shift began. A number of supervisors arrived 35 minutes after the shift started.

5. On March 30, 1973, at the beginning of the first shift, 49 percent of the workers arrived at the north wing wall of the graving dock 15 to 30 minutes after the shift began and 15 percent arrived more than 30 minutes after the shift began.

C. Excessive People Assigned to Job or Work Site or Observing Work

1. On March 27, 1973, second shift, 18 workers and 4 supervisors who appeared to be assigned to the job were standing around watching a crane lift a steam generator on the dock adjacent to WHALE.

2. On March 28, 1973, first shift, 8 tradesmen and one supervisor apparently assigned to the job were observing a semi-automatic hull cut being made on a missile tube penetration topside on LAFAYETTE. Six of 19 other workers topside were also idle.

3. On March 29, 1974, first shift, 5 riggers were apparently assigned to a rigging operation near the #2 missile tube on LAFAYETTE. Only 2 riggers were needed for the job; the other three were idle.

4. On March 30, 1973, first shift, 2 workers were standing at the entrance to the SSN690 reactor compartment warning people to watch out for falling sparks and slag from hot work in the compartment. One person could have served the same purpose.

5. On April 11, 1973, first shift, 47 people were in the lower level engine room of LIPSCOMB. Only 16 of them were working. Five workers were watching one man grind a pipe. Seven other men were in the area where one man was grinding on a bolt. It appeared that at least 4 people were assigned to the area in excess of the number which could be expected to work in the space available.

D. Congregating at Refreshment Stands and Vending Machines

1. On March 9, 1973, first shift, 28 people stopped at a refreshment stand in the graving dock support building during a 15 minute period. Another 17 people were congregated around the stand loafing during this period.

2. On March 28, 1973, 23 men were idle around the graving dock vending machine during a 10 minute period. The area had the appearance of an organized coffee break.

3. On April 11, 1973, first shift, 8 men congregated for about 5 minutes in the vending machine shack at the graving dock.

4. On April 11, 1973, first shift, 6 men congregated for about 5 minutes in the South Yard vending machine shack.

E. Personnel Reading or Posting Unauthorized Notices on Bulletin Boards

1. On March 28, 1973, a total of 113 personal or commercial notices were posted on bulleting boards in various locations of the shipyard.

2. On March 28, 1973, first shift, 59 personal or commerical notices were on a bulleting board in the main machine shop. During a 15 minute period 6 men stopped to read these notices.

3. On March 28, 1973, first shift, 7 personal or commerical notices were posted on a bulleting board in the first floor of the Nuclear Design Building. Two men were drinking coffee and reading the notices.

F. Female Production Workers Contributing to Idleness

1. On February 26, 1973, first shift, one female worker spent an hour sitting in the port passageway of the Auxiliary Machinery Room #2 of LAFAYETTE talking to various male workers. Another female worker attempting, unsuccessfully, to fit a cover on a switchboard received advice and assistance from 12 male workers from several different trades. Her attempts to install the panel were interrupted by a 10 minute conversation unrelated to work.

2. On March 28, 1973, second shift, a female shipfitter delivered four cups of coffee to idle workers in the South Yard Fabrication Area.

✓ 3. On April 5, 1973, first shift, two workers - one male and one female - were kissing in the missile compartment of USS KAMEHAMEHA (SSBN642).

G. Idleness Resulting from Coffee Breaks

1. On March 12, 1973, first shift, 18 of 40 men in the graving dock basin below LAFAYETTE and USS DACE (SSN607) were idle. Four of the idle men were drinking coffee.

2. On March 15, 1973, first shift, 21 of 67 men in the North Yard Fabrication Area were idle. At least 10 of the idle men were drinking coffee.

3. On March 21, 1973, second shift, 4 of 5 workers in the welding shop at the head of the graving dock were talking and joking. One was drinking coffee.

4. On March 22, 1973, first shift, 4 of the 5 workers in the South Yard Electronics Shop were idle drinking coffee and eating sandwiches.

5. On March 28, 1973, first shift, 50 out of 102 workers in the fabrication facility at Midway were idle for 30 minutes drinking coffee, smoking and talking in small groups.

6. On March 30, 1973, first shift, outside the Mockup Building 7 workers were idle taking a coffee break.

7. On April 5, 1973, first shift, 5 workers and one supervisor were idle in the reactor vessel storage house taking a coffee break.

H. General Idleness

1. On March 8, 1973, second shift, 26 of 38 men in the South Yard Fabrication area were standing idle. The men were standing around in groups of 3 [illegible]

2. On March 14, 1973, second shift, four men were sitting on trash cans in the Overhaul Outside Machine Shop smoking and talking.

3. On March 16, 1973, first shift, one man was performing what was supposed to be the latest dance steps to the amusement of 3 other workers.

4. On March 20, 1973, second shift, in the dry dock in which NAUTILUS is docked, 4 of 8 men were sitting underneath the hull talking.

5. On March 21, 1973, second shift, 4 men were idle in the wet dock sheet metal shop. One was sitting down with his feet propped up and one was eating a sandwich.

6. On March 24, 1973, first shift, 7 workmen were sitting down idle in the Chief Petty Officers Quarters aboard LAFAYETTE.

C. B. HAINES
10-6-71

⑨

PROBLEM:

There is a lack of visibility in Electric Boat Division installation and manufacturing schedules. The formats of the group and B/M masters and the contingency time built into them makes it virtually impossible to analyze them. As a result, it is impossible to evaluate to what extent the Design Agent's design and procurement schedules are impacting Electric Boat Division's schedule for SSN690. The compartment schedules do permit some appraisal of design and material support at the group and major manufacturing levels. However, they are not specific at the lower levels of detail.

PROBLEM:

Electric Boat Division has not developed the necessary planning tools required to properly schedule work through the manufacturing shops. As a result it is virtually impossible to detect schedule conflicts and overload conditions until it is too late to manage them successfully. The problem is compounded by the lack of visibility in the manufacturing schedules and by a lack of realism and credibility in manufacturing intervals.

RECOMMENDATION:

The following program would aid in resolving these two problems. The~~y~~ steps should be accomplished in the approximate order listed.

1. The published compartment schedules should be reviewed and concurred in by Operations and Procurement for manufacturing and procurement span times and for installation sequences.
2. Once the above is accomplished, the Design Agent's existing design and procurement delinquencies against those schedules should be flagged to the Design Agent and NAVSHIPS. This should be done on a continuing basis, using the compartment and manufacturing (see below) schedules as a criteria for determing what constitutes a real delinquency.
3. Detailed manufacturing schedules should be prepared for those manufactured items which are deemed to be problem items from a schedule and/or capacity standpoint. These schedules should show the manufacture of seven shipsets

(23)

or material in support of the compartment schedule installation schedules. The schedules should show the flow of material through each work center and should be based on realistic manufacturing span times and Electric Boat Division's existing or readily available capacity (space, machines, manpower). The schedules should reflect prerequisite design and material required dates.

4. Using the manufacturing schedules developed above and the information generated in Manufacturing Engineering's shop capacity studies, machine and work center loading schedules should be developed for those production areas which are suspected of having insufficient or marginal capacity for all firm and likely business. These schedules must support the detailed manufacturing schedules developed above.
5. The detailed manufacturing schedules should then be rescheduled as required by work center overloads to the maximum extent possible. If an overload condition cannot be resolved in the manufacturing schedules, the installation schedules should be revised (if possible) to relieve the problem. If the overload condition cannot be resolved by rescheduling a farmout program should be developed for the impacted work center and the manufacturing and work center schedules should be adjusted accordingly.
6. All schedules (compartment, manufacturing and work center) should be reviewed and revised as necessary on a regular basis.

~~FB~~
A301

(10)

[illegible]
[illegible]

TO: Messrs. E. Holt/R. V. Pierce/T. S. [illegible]

DATE: January 17, 1973

FROM: W. D. Victor

FILE NO.:

SUBJECT: SSN688 Class Recommended Recovery Program

REFERENCE:

During the past year we have encountered a number of problems which have prevented us from effectively using our steel trade manpower to meet our schedule commitments. These problems have included:

a. The effect of extended labor negotiations which resulted in an inability to hire steel trades in support of a peak overhaul workload as well as the increasing demands of the SSN688 Class.

b. Emergent work demands on steel trade manpower which have occurred on SSN571 overhaul, due to late identification of additional work packages by the Government, and which have also resulted from unanticipated SSN667, SSBN601, and SSN637 RAVs in recent months.

c. Late receipt of drawings from the Government's SSN688 Class Design Agent, which effectively delayed the start of SSN688 Class construction. Late drawings also prevented us from working a positive steel fabrication backlog in anticipation of a constantly increasing steel trade manpower demand commencing in the fall of 1972 and continuing through 1973 and beyond.

The result of these problems has been a manpower shortage in the steel trades for work on SSN688 Class ships and, to a lesser degree, on SSN685 and in the overhaul programs. In an attempt to remedy the steel trade manpower shortage created by the problems stated above, we have twice compressed our schedules on the early SSN688 Class ships to the extent that the schedules for the first three ships now only marginally support Launch. Nevertheless, SSN688 Class schedules have slipped and will continue to slip until steel trade manpower input can be increased to the level required to meet the schedules. Although as of today seriously affecting only the first three ships of the 688 Class, the problem will extend to the later ships within the next few months as their fabrication start dates become due. SSN696 is in this position now. This situation will be further aggravated this spring by a heavy demand for X-ray quality welders to weld the patches on SSN685 in support of Launch, in parallel with the consistently high demand of the overhaul program.

While this critical manpower shortage is well recognized, and an intensive hiring program is underway, an interim short range plan must be implemented until the manning increase catches up with the new workload demands plus the delinquency backlog. I believe that it is economically wiser to take immediate drastic action now rather than to wait in the hope that the gradual increase of manning resulting from the hiring and training program will work out the backlog and get the program back on schedule. In my opinion this is highly unlikely, and the result of such

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course of action would be at best a heavy expenditure of overtime manhours late in the programs to recover or at worst a failure to meet delivery commitments on many ships.

To best describe my feeling on the economics of pushing the "front end" of the 688 program, I submit the attached "Basic Submarine Construction Work Profile" which graphically displays the cost payoff of driving the first twelve months of a construction program. Control of the effective use of overtime manhours is inherent in the low number of trades involved in the front end. Control is also more readily achieved through the ability to identify and progress the finite large structural units. There is maximum visibility of what a relatively few number of workers are accomplishing.

On the other hand, the consequences of allowing early work to slip becomes progressively more serious by compromising Work Phase 3, essentially reducing or eliminating visibility and budget control when 800 - 1,000 men are working overtime. Any overtime recovery effort late in the program applies not only to more people but also to the higher wage rate of the future. A maximum effort to regain SSN688 Class schedule now through the use of overtime means that these hours will be spent by experienced men. In the near future, the ratio of experienced to learner will decrease markedly as the hiring and training program output becomes felt. Thus the greater productivity which will be experienced in working overtime now will to a considerable degree offset the premium time pay differential. In addition, the risk of delays incident to unknown problems in the installation and test programs of the early SSN688 Class ships is high, since these are "new" ships. The cost of such program delay would probably exceed present expected overtime costs, in addition to jeopardizing our ability to meet all program contractual obligations.

√ In summary, for the reasons cited above, our most cost-effective course of action is to take immediate steps to prevent further schedule slippage and to reduce the delinquency backlog on the SSN688 Class ships. I strongly recommend therefore, that for the next six months all steel trade work available for accomplishment be worked on a six-day week basis to an order of priority to be established by the Program Managers. This I consider to be the minimum time to achieve any likely reversal of present trends. During this period we will progress and measure results. At the end of the first two months we should be prepared to evaluate the results and if necessary to recommend further drastic action. A similar review would be made each succeeding month.

In order to restrict this recommended overtime program to the minimum duration, consistent with meeting the demands of the SSN688 Class steel fabrication and hull erection schedules, plus elimination of the existing delinquency backlog, I further strongly recommend that immediate steps be taken to institute a subcontract program on the SSN688 Class of a magnitude sufficient to ensure that high quality EBDiv steel trade manpower is made available in numbers sufficient to bring the early ships in the program back on to the schedule, as well as meeting the demands of the later ships as that work is required. This subcontract program should be continued until such time as the hiring and training program is capable of enabling

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us to maintain an in-house effort sufficient to work a positive backlog ahead of the SSN 688 Class schedules as has been directed by the General Manager.

NDVictor
N. D. Victor
Planning Manager

NDV/rw

cc: Messrs. G. O'Neill
J. D. Pierce
G. W. Roos

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GENERAL DYNAMICS
Electric Boat Division

To: J. D. Pierce Date: 6/15/73

From: J. F. BURNS

There is nothing wrong with this Critical Items letter so I have signed off on it.

However, for weeks we have had the same two items, Material and Manpower, in a format that is no longer meaningful. How many line items are late, how bad is the deficit, and what is the trend? Re manpower, how many hours are we behind, etc.?

It's time to stand back and give HGR a meaningful, overall assessment, and stop the fragmented details we put out each week.

For future consideration, how about major components, procedures, plans, etc.? This letter could serve a purpose for EBDiv, but in its present format its stereotyped and thus lacks a lot in my opinion.

J.F.B.

Henry Hyman —
Concur that we could make this more meaningful
[illegible]

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GENERAL DYNAMICS
Electric Boat Division
Eastern Point Road, Groton, Connecticut 06340 • [illegible]

File No.: 688/559/EH/JDP March 23, 1973

Subject: SSN688 Class Critical Items Letter No. 40

Vice Admiral H. G. Rickover, USN
NAVSHIPS 08
Naval Ship Systems Command Headquarters
Navy Department
Washington, D. C. 20360

SIR:

The following items are considered critical to the SSN688 Class Program.

ITEM 1 - LATE RECEIPT OF 688 CLASS MATERIAL

Material receipt, other than steel, is not occurring to support scheduled manufacturing and installation efforts on the SSN690.

Present Action

In our March 9, 1973 Critical Items Letter we stated that the Purchasing Department commitment was to receive 1800 shop order line items during the month of March. For the first two weeks we only received half the line items that were committed. This has been reviewed with Purchasing and they still feel they will meet their commitment.

ACTION

Holt
Painter
Victor
(EB)

Action Required

Continue expediting material through receipt, collection, and availability.

Assistance Required

None

---

cc: ~~Mr.~~ RM Forssell, NAVSHIPS 08
~~Mr.~~ EC Brolin, NAVSHIPS 08
~~Mr.~~ EJ Siskin, AEC Rep-Groton

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ITEM 2 - MANPOWER NOT AVAILABLE FOR SHIPBOARD WORK

Manhours are not being expended at the rate required to meet SSN688 Class ships' schedules.

Present Action

We have accelerated our hiring rate. Since the beginning of October 1972 we have hired 1,480 people. Our Welding School will have to qualify about 350 qualified welders; so far 145 qualified welders have been sent to the shipyard. Emphasis has been placed on moving employes from structural shop work to shipboard work, with later ship structural shop work being farmed-out to qualified vendors. Action has been started to qualify about 75 pipe welders by September 1, 1973, of which 23 have been qualified to date.

ACTION	Action Required
Holt Roos Cramer Gregory,RK (EB)	Better projections of manpower requirements based on material availability and ship readiness.

Assistance Required

None

The writer understands that the reporting of these critical items does not relieve him of the responsibility of seeing that the necessary corrective action is taken on these items.

Very truly yours,

E. Holt
SSN688 Class Program Manager

Approved: J. D. Pierce
General Manager

cc: Mr. RM Forssell, NAVSHIPS 08
Mr. EC Brolin, NAVSHIPS 08
Mr. EJ Siskin, AEC Rep-Groton

GENERAL DYNAMICS
Electric Boat Division
Eastern Point Road, Groton, Connecticut 06340 • 203 446-5980

File No.: 688/[illegible]/ZHH/JDP May 4, 1973

Subject: SSN688 Class Critical Items Letter No. 46

Vice Admiral H. G. Rickover, USN
NAVSHIPS 08
Naval Ship Systems Command Headquarters
Navy Department
Washington, D. C. 20360

S I R :

The following items are considered critical to the SSN688 Class Program.

ITEM 1 - LATE RECEIPT OF 688 CLASS MATERIAL

Material receipt, other than steel, is not occurring to support scheduled manufacturing and installation efforts on the SSN690.

Present Action

Expediting action for Pipe Shop material has resulted in material availabilities for about 1,000 details. Continuous action is being applied in this area to accelerate deliveries.

Material receipt for the month of April was about 100 shop order line items below target.

We have just reviewed vendor promise delivery dates of key hardware. Many items are arriving later than schedule dates, but do not require the change of major key events. Detail schedules are being revised.

ACTION	Action Required
Hyman Painter Victor (EB)	Continue expediting material through receipt, collection, and availability.
	Assistance Required
	None

cc: Mr. RM Forssell, NAVSHIPS 08
Mr. EC Brolin, NAVSHIPS 08
Mr. EJ Siskin, AEC Rep-Groton

ITEM 2 - MANPOWER NOT AVAILABLE FOR SHIPBOARD WORK

Manhours are not being expended at the rate required to meet SSN688 Class ships' schedules.

Present Action

We are farming out SSN696 and SSN697 Graph Cut work to Quincy Shipbuilding. Since our April 6, 1973 letter, we have added 214 people to our payroll with an additional 106 people hired (but not on roll).

Previously, we reported that forty-eight welders were being qualified for pipe welding. In addition, we have added twenty-seven welders to the program for a total of seventy-five. We have qualified four welders, thirty-eight have passed initial qualification and are undergoing selected material qualification, sixteen are undergoing initial qualification, seven withdrew from the program, and ten were disqualified.

ACTION	Action Required
Hyman Victor Roos Gregory, R (EB)	Better projections of manpower requirements based on material availability and ship readiness. Assistance Required None

The writer understands that the reporting of these critical items does not relieve him of the responsibility of seeing that the necessary corrective action is taken on these items.

Very truly yours,

Z. Henry Hyman
SSN688 Class Program Manager

Approved: JDPierce
J. D. Pierce
General Manager

cc: Mr. RM Forssell, NAVSHIPS 08
Mr. EC Brolin, NAVSHIPS 08
Mr. EJ Siskin, AEC Rep-Groton

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GENERAL DYNAMICS
Electric Boat Division
Eastern Point Road, Groton, Connecticut 06340 • 203 445-5960

File No.: 692/722/ZHH/JDP

September 14, 1973

Subject: SSN688 Class Critical Items Letter No. 65

Vice Admiral H. G. Rickover, USN
NAVSHIPS 08
Naval Ship Systems Command Headquarters
Navy Department
Washington, D. C. 20360

S I R :

The following items are considered critical to the SSN688 Class Program.

ITEM 1 - LATE RECEIPT OF 688 CLASS MATERIAL

Material receipt, other than steel, is not occurring to support scheduled manufacturing and installation efforts on the SSN690.

Present Action

The SSN690 material receipt of shop order line items for the week ending September 7, 1973 was 109 line items.

As of September 7, 1973, 13,771 shop order line items have been ordered for the SSN690. A total of 10,179, approximately 74%, have been received.

9,433 of the 12,302 line items scheduled to be received (WAS have been received, resulting in a schedule delinquency of approximately 23.3%, compared to 23.7% the previous week.

The following key delivery improvements have been realized this week.

Boat	Item	Was	Now
SSN690	Boiler Water Sample Cooler	8/15/74	5/31/74
SSN690	3" Hex Nuts (Stm Gen.)	3/25/74	9/14/73
SSN690	Hyd By-Pass Vlvs	3/23/74	11/9/73
SSN690	Hyd Emer Control Vlvs	3/23/74	1/5/74
SSN690	Hyd Servo Vlvs	3/23/74	11/13/73

cc: Mr. RM Forssell, NAVSHIPS 08
Mr. EC Brolin, NAVSHIPS 08
Mr. EJ Siskin, NRRO-Groton

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ACTION

Hyman
Painter
Victor
(EB)

Action Required

Continue expediting material through receipt, collection, and availability.

Assistance Required

None

ITEM 2 - MANPOWER NOT AVAILABLE FOR SHIPBOARD WORK

Manhours are not being expended at the rate required to meet SSN688 Class ships' schedules.

Present Action

Progress continues to be evident on the SSN690. The second [redacted] with [redacted] pumps installed, [redacted] pumps and the [redacted] air compressor have been landed in the [redacted]. Additionally, the piping to the [redacted] tank is being installed. Installation of bank piping is continuing in the [redacted] compartment.

A temporary re-assignment of structural welders and support trades from the SSN688 Class program is being accomplished to support other critical shipyard work.

ACTION

Hyman
Victor
Gregory, R
(EB)

Action Required

Assess the impact of the temporary reduction of structural welders and support trades on the SSN688 Class construction program.

Develop a program for the most effective utilization of the available structural welders and other shipyard trades to ensure that progress on the SSN690 is not significantly affected.

Assistance Required

None

---

cc: Mr. RM Forssell, NAVSHIPS 08
Mr. EC Brolin, NAVSHIPS 08
Mr. EJ Sickin, NRRC-Groton

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GENERAL DYNAMICS
Electric Boat Division

688/722/ZHH/JDP
September 14, 1973

The writer understands that the reporting of these critical items does not relieve him of the responsibility of seeing that the necessary corrective action is taken on these items.

Very truly yours,

for W. M. Lennon
Z. Henry Hyman
SSN688 Class Program Manager

Approved: J D Pierce
J. D. Pierce
General Manager

cc: Mr. RM Forssell, NAVSHIPS 08
Mr. EC Brolin, NAVSHIPS 08
Mr. EJ Siskin, NRRO-Groton

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GENERAL DYNAMICS
Electric Boat Division
stern Point Road, Groton, Connecticut 06340 • 203 446-5960

File No.: 688/788/ZHH/JDP November 21, 1973

Subject: SSN688 Class Critical Items Letter No. 75

Vice Admiral H. G. Rickover, USN
NAVSHIPS 08
Naval Ship Systems Command Headquarters
Navy Department
Washington, D. C. 20360

SIR:

The following items are considered critical to the SSN688 Class Program.

ITEM 1 - LATE RECEIPT OF 688 CLASS MATERIAL

Material receipt, other than steel, is not occurring to support scheduled manufacturing and installation efforts on the SSN690.

Present Action

The SSN690 material receipt of shop order line items for the week ending November 16, 1973 was 87 line items.

As of November 16, 1973, 14,445 shop order line items have been ordered for the SSN690. A total of 11,494, approximately 79.5% have been received.

11,100 of the 13,582 line items scheduled to be received have been received, resulting in a schedule delinquency of approximately 18%.

ACTION	Action Required
Hyman Painter Victor (EB)	Continue expediting material through receipt, collection, and availability.

Assistance Required

None

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cc: Mr. RM Forssell, NAVSHIPS 08
Mr. EC Brolin, NAVSHIPS 08
Mr. EJ Siskin, NRRO-Groton

GENERAL DYNAMICS
Electric Boat Division

688/688/ZHH/JDP
November 21, 1973

ITEM 2 - MANPOWER NOT AVAILABLE FOR SHIPBOARD WORK

Manhours are not being expended at the rate required to meet SSN688 Class ships' schedules.

Present Action

Seven (7) structural welders, that satisfactorily completed their qualification on November 19, 1973, have been assigned to the manufacturing area.

Progress continues to be evident on the SSN690:

Additional piping has been installed in the pipe banks in the engine room and reactor compartment.

Lagging of the pressurizer has been started.

ACTION	Action Required
Hyman Victor Gregory, R (EB)	Continue to evaluate ship's progress and expedite shipyard installation trades based on material availability and ship readiness. Assess the impact of the temporary reduction of structural welders and support trades on the SSN688 Class construction program.

Assistance Required

None

The writer understands that the reporting of these critical items does not relieve him of the responsibility of seeing that the necessary corrective action is taken on these items.

Very truly yours,

Z Henry Hyman
Z. Henry Hyman
SSN688 Class Program Manager

Approved: J D Pierce
J. D. Pierce
General Manager

cc: Mr. RM Forssell, NAVSHIPS 08
Mr. EC Brolin, NAVSHIPS 08
Mr. EJ Siskin, NRRO-Groton

[illegible]
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GENERAL DYNAMICS
Electric Boat Division
Eastern Point Road, Groton, Connecticut 06340 • 203 446-5960

File No.: 688/807/ZHH/JDP December 14, 1973

Subject: SSN688 Class Critical Items Letter No. 78

Admiral H. G. Rickover, USN
NAVSHIPS 08
Naval Ship Systems Command Headquarters
Navy Department
Washington, D. C. 20360

SIR:

The following items are considered critical to the SSN688 Class Program.

ITEM 1 - LATE RECEIPT OF 688 CLASS MATERIAL

Material receipt, other than steel, is not occurring to support scheduled manufacturing and installation efforts on the SSN690.

Present Action

The SSN690 material receipt of shop order line items for the week ending December 7, 1973 was 106 line items.

As of December 7, 1973, 14,717 shop order line items have been ordered for the SSN690. A total of 11,834 or 81% have been received.

11,484 of the 13,887 line items scheduled to be received have been received, maintaining a schedule delinquency of 17% compared to 18% last week.

ACTION

Hyman
Painter
Victor
(EB)

Action Required

Continue expediting material through receipt, collection, and availability.

Assistance Required

None

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cc: Mr. MM Forssell, NAVSHIPS 08
Mr. EC [illegible]lin, NAVSHIPS 08
Mr. EJ Siskin, NRRO-Groton

GENERAL DYNAMICS
Electric Boat Division

688/807/ZHH/JDP
December 14, 1973

ITEM 2 - MANPOWER NOT AVAILABLE FOR SHIPBOARD WORK

Manhours are not being expended at the rate required to meet SSN688 Class ships' schedules.

Present Action

Fifteen (15) structural welders, that satisfactorily completed their qualification on December 10, 1973, have been assigned to the manufacturing area.

Progress continues to be evident on the SSN690:

Additional piping has been installed in the pipe bank in the [redacted] room.

The welding of the upper tank top plate of the [redacted] tank is continuing.

The [redacted] tank has been installed in the [redacted].

ACTION	Action Required
Hyman Victor Gregory,R (EB)	Continue to evaluate ship's progress and expedite shipyard installation trades based on material availability and ship readiness. Assess the impact of the temporary reduction of structural welders and support trades on the SSN688 Class construction program.

Assistance Required

None

The writer understands that the reporting of these critical items does not relieve him of the responsibility of seeing that the necessary corrective action is taken on these items.

Very truly yours,

Z. Henry Hyman
Z. Henry Hyman
SSN688 Class Program Manager

Approved: J. D. Pierce
J. D. Pierce
General Manager

cc: Mr. RM Forssell, NAVSHIPS 08
Mr. EC Brolin, NAVSHIPS 08
Mr. EJ Stekin, [illegible]

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GENERAL DYNAMICS
Electric Boat Division
Eastern Point Road, Groton, Connecticut 06340 • 203 446-8180

File No.: 688/818/ZHH/JDP December 21, 1973

Subject: SSN688 Class Critical Items Letter No. 79

Admiral H. G. Rickover, USN
NAVSHIPS 08
Naval Ship Systems Command Headquarters
Navy Department
Washington, D. C. 20360

S I R :

The following items are considered critical to the SSN688 Class Program.

ITEM 1 - LATE RECEIPT OF 688 CLASS MATERIAL

Material receipt, other than steel, is not occurring to support scheduled manufacturing and installation efforts on the SSN690.

Present Action

As a result of expediting efforts, the overall material receipt delinquencies have been reduced to less than 15%. This delinquency is manageable and will allow specific attention to be directed to those critical items that can adversely affect scheduled manufacturing and installation efforts.

Only specific problem areas will be reported on this item.

Pipe Fittings and Valves

A major effort is continuing to expedite delivery of inconel, monel, and CuNi butt weld fittings and Navy Standard Valves to 810-2177525 required to support fabrication of the [redacted] service systems. To date, 84% of the SSN690 fittings have been received. The balance are estimated to be received by 2/15/74. The initial shipments of Navy Standard Valves to 810-2177525 were made from Electric Boat Division's prime source (Morland Tool Company) during the week of 12/10/73. An additional shipment is promised for the week of 12/17/73. It is anticipated that all SSN690 requirements will be satisfied by 3/31/74.

cc: Mr. RM Forssell, NAVSHIPS 08
Mr. EC Brolin, NAVSHIPS 08
Mr. EJ Siskin, NRRO-Groton

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Engine Room Fresh Water/Salt Water Heat Exchanger

The vendor's (Carrier Corporation) estimated shipment dates for the [redacted] heat exchangers have slipped from the original promised delivery date of October 1973 to the current estimated dates of 2/15/74 (first unit) and 2/22/74 (second unit). Late receipt of the heat exchangers will delay timely completion of the [redacted] system in support of launch. Electric Boat Division has assisted Carrier Corporation by providing critically needed raw materials where Carrier was unable to obtain them within reasonable periods of time. Procurement is closely monitoring vendor progress and maintaining contact with the vendor's management to ensure the earliest possible completion of the units.

ACTION	Action Required
Hyman Painter Victor (EB)	Continue expediting material through receipt, collection, and availability.

Assistance Required

None

ITEM 2 - MANPOWER NOT AVAILABLE FOR SHIPBOARD WORK

✓

Manhours are not being expended at the rate required to meet SSN688 Class ships' schedules.

Present Action

There are 162 additional equivalent structural welders assigne to the SSN688 Class program, and more specifically the SSN690, than were assigned on 14 September 1973, when structural welde were temporarily assigned to other critical work in the shipyard.

The present manning on the SSN690 is satisfactory for the ship readiness condition and material availability.

This item will no longer be reported unless the corrective action taken does not continue to achieve the desired results.

Action Required

None

Assistance Required

None

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DYNAMICS CORPORATION.

cc: Mr. RM Forssell, NAVSHIPS 08
Mr. EC Brolin, NAVSHIPS 08
Mr. EJ Siskin, NRRO-Groton

GENERAL DYNAMICS
Electric Boat Division

688/818/ZHH/JDP
December 21, 1973

The writer understands that the reporting of these critical items does not relieve him of the responsibility of seeing that the necessary corrective action is taken on these items.

Very truly yours,

Z. Henry Hyman
Z. Henry Hyman
SSN688 Class Program Manager

Approved: J. D. Pierce
J. D. Pierce
General Manager

cc: Mr. RM Forssell, NAVSHIPS 08
Mr. EC Brolin, NAVSHIPS 08
Mr. EJ Siskin, NRRO-Groton

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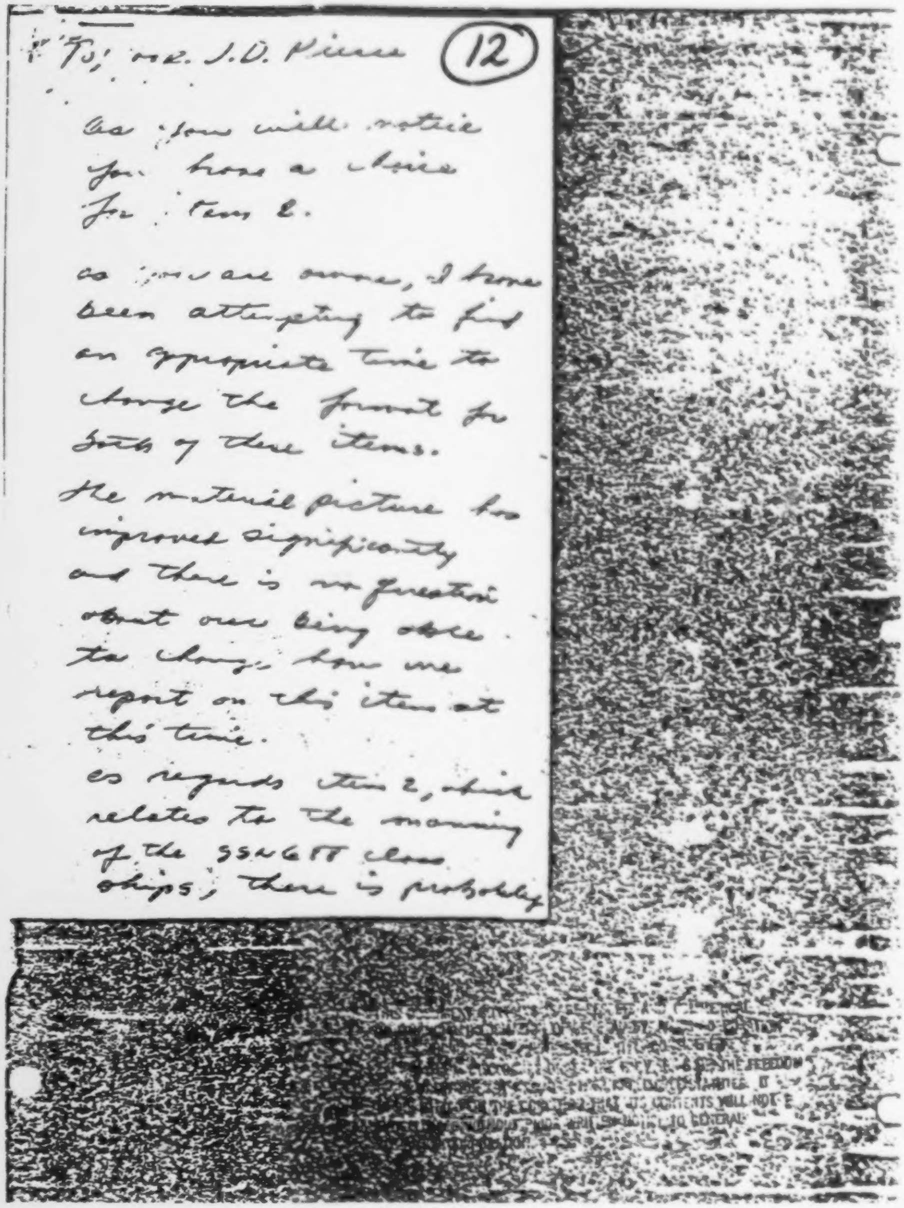


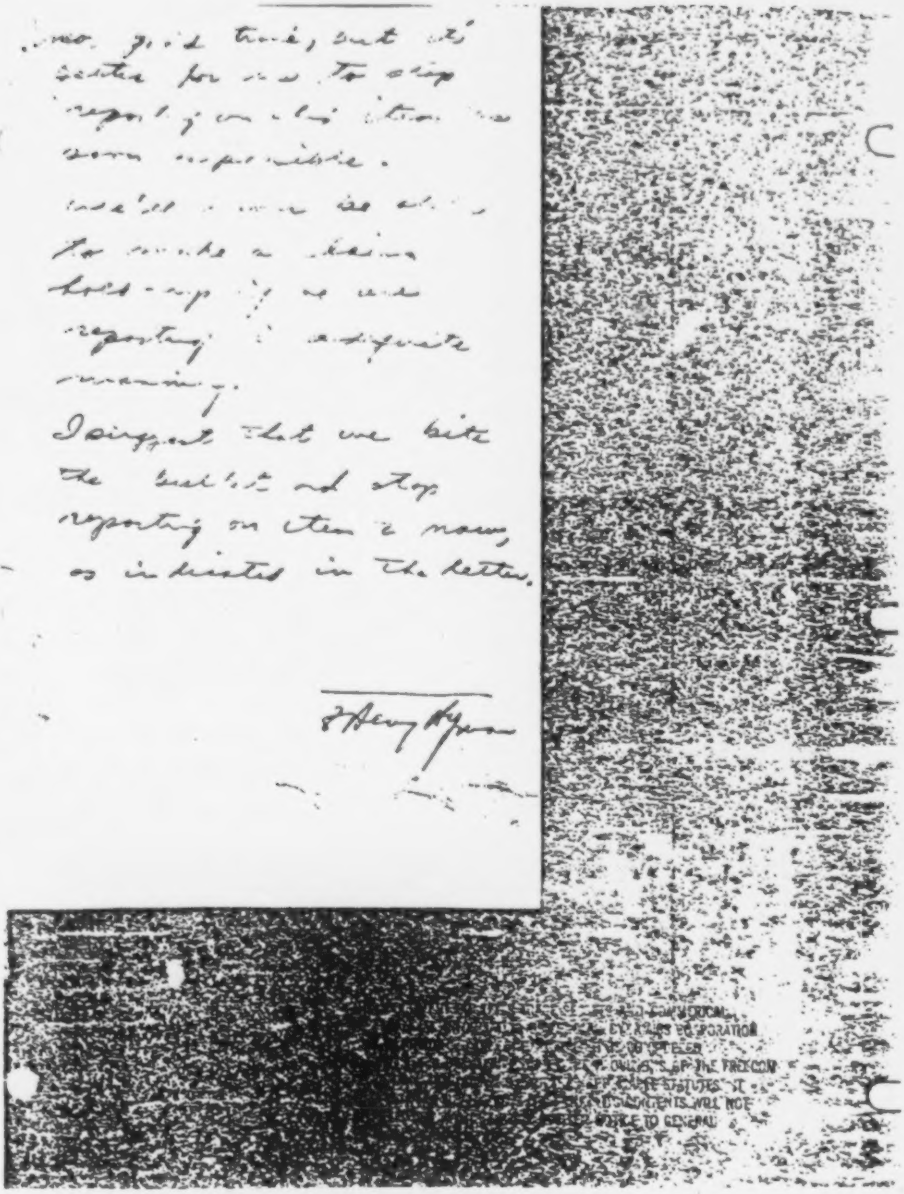
To: Mr. J.D. Pierce ⑫

As you will notice you have a choice for item 2.

As you are aware, I have been attempting to find an appropriate time to change the format for both of these items.

The material picture has improved significantly and there is no question about our being able to change how we report on this item at this time.

As regards item 2, which relates to the manning of the SSN688 class ships, there is probably



no good time, but it's better for us to stop reporting on this item as soon as possible.

We'll [illegible] be able to make a claim hold-up if our reporting is adequate [illegible].

I suggest that we bite the bullet and stop reporting on item 2 now, as indicated in the letter.

AND COMMERCIAL
BY XEROX CORPORATION
OF THE FREEDOM
STATUTES. IT
DOCUMENTS WILL NOT
NOTICE TO GENERAL

13

5

3-28-73

CURRENT STATUS OF FY 70-72 CONTRACT

SSN 690 -

SCHEDULE - RESCHEDULED 12/72. (SCHEDULE) INTERVAL TO LAUNCH IS TIGHTER THAN ACTUAL PERFORMANCE FOR COMPARABLE PERIOD ON SSNS 673 AND 678 CLASSES.

SCHEDULE CONTINGENCY - 6 WEEKS CONTINGENCY IN LAUNCH SCHEDULE. 6 ADDITIONAL WEEKS IN SEA TRIAL PERIOD

6 WKS HAVE BEEN LOST
6 REMAINING

STATUS - DURING 3 MONTH PERIOD 12/72 TO 3/73 SSN 690 HAS SLIPPED 6 WEEKS FURTHER BEHIND SCHEDULE (EATEN UP 6 WKS CONTINGENCY). THE RATE OF SLIPPAGE HAS NOT DECREASED. WE ARE CONTINUING TO LOSE APPROX. 1 WEEK PROGRESS FOR EVERY 2 WEEKS OF CALENDAR TIME. AT THIS RATE ALL CONTINGENCY

4

WILL HAVE BEEN DISSIPATED
BY JUNE/JULY 197~~2~~3. MANPOWER (WELDER
SHORTAGE IS MAJOR REASON FOR SLIPPAG

OUTLOOK: SSN 690 IS EXPERIENCING
~~[illegible]~~ TYPICAL PROTOTYPE TECHNICAL PROBLEMS.
SOME OF THESE PROBLEMS ARE AFFECTI
(AND DELAYING) CONTROLLING PATHS,
EB DIV IS NOT ~~[illegible]~~ LEARNING
FROM PROTOTYPE (688) EXPERIENCE
DUE TO 688 DELAYS. MAJOR POTENTI
PROBLEM AREA (PIPING) IS STILL
AHEAD OF US. TECHNICAL PROBLEMS IN
PIPING WILL BE COMPOUNDED BY LATE RECE
OF PIPING MATERIAL AND PIPE WELDER SHOR

SSNS 692-696 THESE SHIPS ARE
ALL 6-8 WEEKS BEHIND SCHEDULE
AND SLIPPING.

MATERIAL STATUS

- ~~ANY~~ MAJORITY OF MAJOR COMPONENT / CASTING ORDERS WERE PLACED LATE TO OUR SCHEDULE REQUIREMENTS DUE TO LATE PROCUREMENT / (DESIGN ACTION) BY LEAD YARD.
- MOST MAJOR COMPONENTS / CASTINGS WILL BE RECEIVED ~~[illegible]~~ LATE TO SCHEDU

~~SECRET~~

- MANY TECHNICAL AND VENDOR CAPABILITY CAPACITY PROBLEMS STILL TO BE RESOLVED ON MAJOR ITEMS

- BULK OF FITTINGS, VALVES, ETC PURCHASE ORDERS PLACED LATE TO SCHEDULE.

- EB DIV MACHINE SHOP CAPACITY PROBLEM ~~[illegible] MATERIAL [illegible]~~ AGGRAVAT MATERIAL PROBLEM
DESIGN AGENT SOFTWARE

- DRAWING SCHEDULE WAS RESCHEDULED MANY TIMES AND DESIGN AGENT IS APPROX 1 - 1½ MONTHS DELINQUENT TO * LATEST SCHEDULE.

- BULK OF D.A. PROVIDED W/A PAPER AND MATERIAL SOURCES RECEIVED LATE TO EB DIV'S SCHED REQUIREMENTS.

- MANY LATERS & RESERVES IN D/A SOFTWARE, TYPICAL OF [illegible]

WILL HAVE BEEN DISSIPATED BY JULY 1972. MANPOWER (WELDERS SHORTAGE) IS MAJOR REASON FOR SLIPPAGE.

OUTLOOK SSN 690 IS EXPERIENCING ~~A~~ TYPICAL PROTOTYPE TECHNICAL PROBLEMS. SOME OF THESE PROBLEMS ARE AFFECTING (AND DELAYING) CONTROLLING PATHS. EB DIV IS NOT ~~[illegible]~~ LEARNING FROM PROTOTYPE (688) EXPERIENCE DUE TO 688 DELAYS... MAJOR POTENTIAL PROBLEM AREA (PIPING) IS STILL AHEAD OF US. TECHNICAL PROBLEMS IN PIPING WILL BE COMPOUNDED BY LATE RECEIPT OF PIPING MATERIAL AND PIPE WELDER SHORTAGE.

AUX REACTOR BULKHEAD DESIGN CHANGES
SHIELDING DESIGN HOLD PROCEDURE CHANGES
MAIN COOLANT LOOP DESIGN AND PROCEDURE CHANGES
AUXILIARY TANK DESIGN CHANGES
PRIMARY SHIELD TANK PROCEDURE CHANGES ②

SSNS 692-696. THESE SHIPS ARE ALL 6-8 WEEKS BEHIND SCHEDULE AND SLIPPING.

II MATERIAL STATUS

- MAJORITY OF ~~[illegible]~~ MAJOR COMPONENT / CASTING ORDERS WERE PLACED LATE TO OUR SCHEDULE REQUIREMENTS DUE TO LATE PROCUREMENT / DESIGN ACTION BY LEAD YARD.

VALVES: MAIN STEAM ROOT
MAIN STEAM CUTOUT

HEAT EXCHANGERS: ENGINE ROOM FRESH WATER
ELEX AND AUX FRESH WATER

CASTINGS: MSW VALVES
ASW VALVES
DIESEL VALVES
RUDDER S[illegible]
RUDDER S[illegible]

PUMPS: MAIN SEAWATER
AUX SEA WATER
FEED
CONDENSATE
LUBE OIL

ORDERS:

MAIN SEA WATER PUMPS - BYRON JACKSON - CAPABILITY

~~[illegible]~~ ENG. RM FRESH WATER/SALT WATER HEAT EXCHANGERS - CARRIER - NEW VENDOR

AUX SEA WATER PUMPS
CONDENSATE PUMPS
FEED PUMPS
ENG RM FRESH WATER PUMPS
AIR COND CHILL WATER PUMPS
ELEC AUX FRESH WATER PUMPS
INGERSOLL RAND - ③ CAPACITY

~~[illegible]~~

MN STEAM CUTOUT VALVE - VELAN - NEW VENDOR DISQUALIF

III

- MANY TECHNICAL AND VENDOR CAPA CAPACITY PROBLEMS STILL TO BE RESOLVED ON MAJOR ITEMS

STEAM SYSTEM VALVES
NUCLEAR SYSTEM VALVES/FITT

- BULK OF FITTINGS, VALVES, ETC PURCHASE ORDERS PLACED LATE TO SCHEDULE.

AUX SEA WATER PIPE/FIT

- EB DIV MACHINE SHOP CAPACITY PROBLEM ~~[illegible]~~ AGGRAVA MATERIA PRODUC

DESIGN AGENT SOFTWARE

~~[illegible]~~ PIPING FITTINGS THAT FEED PIPE SHOP B/M's;

- DRAWING SCHEDULE WAS RESCHEDULED MANY TIMES AND DESIGN AGENT IS APPROX 1 - 1½ MONTHS DELINQUENT TO LATEST SCHEDULE

~4800 REQ'D DWGS
3600 RCVD TO DATE

MAJOR RESCHEDULES
JULY 1971
NOV 1971
MARCH 1972
JULY 1972

- BULK OF D.A. PROVIDED W/A PAPER AND MATERIAL SOURCES RECEIVED LATE TO EB DIV'S SCHED REQUIREMENTS.

AS OF 3/21 127 B/M W/A's WERE HELD UP B/ LACK OF DESIGN AGENT DATA

- MANY LATERS & RESERVES

APPROX 440 DWGS CURRENTLY HELD 1 OR MORE [illegible] ON LA

(14)

4-11-73
1037

D R A F T

SSN688 Class Schedule Development

The schedules for the FY 70-72 SSN688 Class ships were designed to deliver seven (7) ships from EBDiv's existing facilities with minimum new capital investment. The principal features of the schedule were:

1. Five (5) month intervals between the start fab dates of the ships to level the workload in the steel fabrication areas and preclude a capacity problem.
2. Four-and-one-half (4½) month intervals between the vessel launch dates to level the installation trade workloads.
3. Four (4) month intervals between deliveries (dictated by RFP).

Following Contract Award on 1/8/71, a decision was made to accelerate the schedules on all ships by moving the launch dates six (6) weeks earlier. This was done to:

1. Improve EBDiv's competitive position for the FY 73-74 awards.
2. Accelerate the start-up of steeltrade work to avert laying off welders and shipfitters.
3. Provide additional assurance of meeting the FY 70/72 contract schedules.
4. To maintain maximum "pressure" on the Design Agent who was delinquent to his Design Schedule.

The objectives of the accelerated schedules were met throughout late 1971 and early 1972. The steelwork progressed generally as scheduled. By mid-1972, however, EBDiv began encountering technical problems (particularly in the nuclear area) which started to slow progress. A significant complicating factor was that Newport News had fallen far behind schedule on the SSN688 and EBDiv was encountering many of the technical problems before Newport News. Each time this occurred, delays were encountered while the Design Agent resolved the problem.

Throughout 1971 and until August 1972 the Design Agent rescheduled the Class Drawing Issue Schedule repeatedly. These slippages did not however have a great impact on the steelwork.

The protracted labor negotiations through the summer and fall of 1972 - during which time the shipyard was unable to hire ~~not hiring~~ - stalled a ~~the~~ steeltrades building ~~hiring~~ program that was required to meet the shipyard's rising workload. The ~~simultaneous~~ buildup of the shipyard's

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overhaul and repair workload in the fall of 1972 imposed a higher priority demand on the available steeltrades at the same time ~~as~~ that the 688 Class demands were growing. To meet the overhaul and repair requirements, shipfitters and welders were transferred from the 688 Class throughout the fall of 1972 and winter of 1973.

The SSN690, 692, and 694 schedules were progressively slipped throughout the summer and fall of 1972 as actual progress continued to lag the published schedules.

The latest SSN690 schedule is roughly equivalent to a follow-on SSN637 Class ship schedule for the period from now to Launch - an exceeding optimistic schedule for a prototype ship.

Status

The current status against the latest published schedules is as follows:

SSN690 approximately 8-10 weeks delinquent
692 approximately 8-10 weeks delinquent
694 approximately 8 weeks delinquent
696 approximately 9 weeks delinquent
697 approximately 2 weeks delinquent

These delinquencies are growing at an average rate of two weeks per month due to a lack of sufficient steeltrades manpower.

What Must be Done to Recover

The immediate needs of the program are additional welders and an effective farmout/subcontract program to offset the mounting backlog of delinquent work. The 688 program has gained little additional manpower in the past six months and the farmout and subcontract programs have not had a significant impact to date. In the meantime, overtime should be used to the maximum extent possible.

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Outlook

The slippage of the steeltrades work will have a pronounced impact on the installation trades. The installation trades will be the victims of late drawing issue; late material identification, ordering and receipt; and poor EBDiv machine shop support due to capacity problems (material, manpower, priority). These problems will be further aggravated by late accomplishment of prerequisite structural work (decks, foundations, etc.) due to the steeltrade delinquencies.

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(15) 137

New Construction Planning
April 24, 1973/CBH

FACTORS THAT HAVE IMPACTED THE 688 CLASS SCHEDULES

The 688 Class was worked on or ahead of schedule throughout the latter half of 1971 and first six (6) months of 1972. The shipyard's performance to schedule began to deteriorate in July 1972. There were three basic factors that contributed to the deterioration:

1. The protracted labor negotiations which dragged on from July to October resulted in low worker morale and lower-than-normal productivity.
2. The shipyard refrained from hiring during the labor negotiations in spite of the fact that the scheduled workload was rising.
3. The overhaul and repair workload rose significantly in the fall of 1972 with the arrival of SSBN616 and SSN607, plus the growth of emergent work on SSN571.

The impact of the decision not to hire during the July-to-October 1972 period and the growth in the Overhaul and Repair business during the fall of 1972 can be seen in the attached chart. The 688 Class began to fall behind schedule in mid-1972 and has continued to slip as the number of manhours expended on the program has continued to fall short of the program's manpower plan.

The 688 manpower problem has been particularly hampered by the large amount of structural work in the SSBN616 missile tube conversion. The 616 requirement fell on top of a 688 Class structural workload that is expanding at the rate 7500 manhours per month during the period September 1972 through October 1973. The overhaul program requirements are continuing to grow, continuing to be accorded first priority and continuing to drain qualified welders from the 688 Class. A complicating factor has been that the shipyard's requirements for pipe welders, structural inspectors and welder supervisors are also rising and these requirements are being filled from the ranks of the more experienced first class welders.

A shortage of machine shop capacity (primarily attributable to a shortage of machinists and overhaul ship priorities) has also impacted the 688 Class program. The problem is being alleviated through the farmout of machining operations, but the volume of farmout to date has not been sufficient to make an appreciable dent in the accumulated backlog of delinquent 688 Class work.

MTC LABOR CONTRACT SIGNED 10/27/72

WAGE/PRICE REVIEW BOARD APPROVAL 12/13/72

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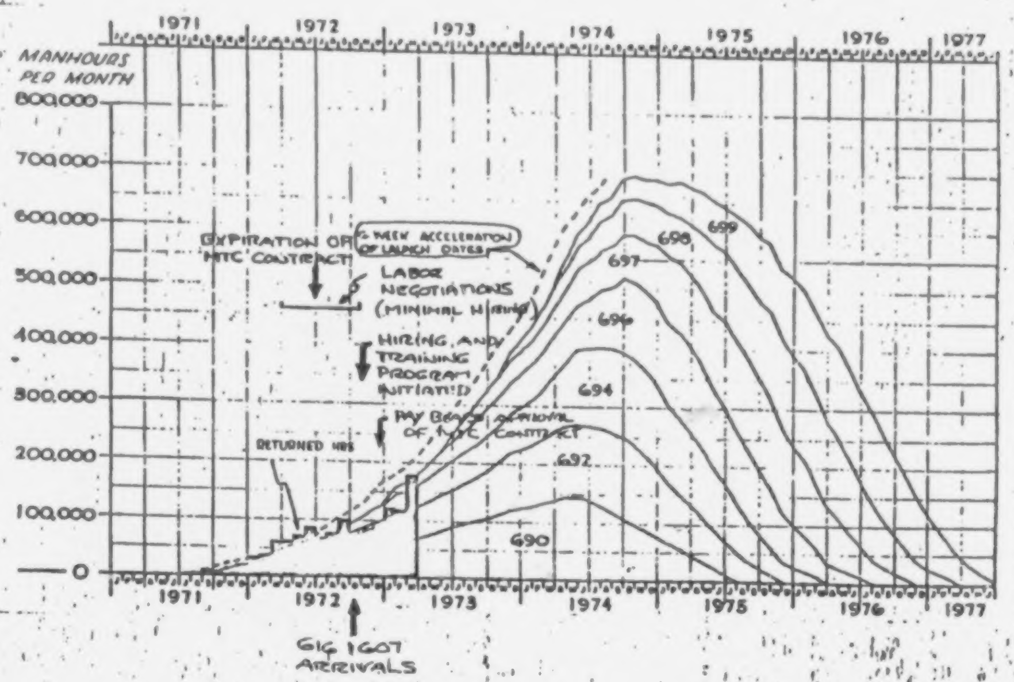
(a)

DIRECT LABOR MANPOWER CURVES

GENERAL DYNAMICS

ITEM 12 SSN 690,692,694,696,697,698,699 ALL TRADES



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SSN 690 CONSTRUCTION CONTRACT
COST PERFORMANCE REVIEW

AS OF 11/24/73

CHART #1. GENERAL COMMENT
2. KEY INDICATORS STATUS AND CHARTS
3. POTENTIAL PROBLEMS

16

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GENERAL COMMENTS

1. THE OVERALL PICTURE FOR SSN690 IS NOT IMPROVING. WITH SEPTEMBER THE ONLY RECENT EXCEPTION, COSTS PER MONTH CONTINUE TO RISE WHILE PROGRESS PROCEEDS AT A GENERALLY STATIC RATE.

   THE VARIANCE BETWEEN THE CURRENT BUDGET AND C.T.C. HAS WIDENED COMPARED TO THE PREVIOUS MONTH WITH THE GROWTH IN MANHOURS AND RELATED OVERHEAD THE PRIME OFFENDER. THIS MANHOUR GROWTH IS THE MOST SERIOUS PROBLEM AFFECTING SUCCESSFUL COMPLETION OF SSN690. EVEN AFTER EXCLUDING THE GROWTH CAUSED BY CHANGES IN CHARGING PATTERNS, UNEXPLAINED MANHOUR CHARGES HAVE AFFECTED SSN690 SO ADVERSELY THAT OVERALL PERFORMANCE IS WORSE THAN ANY SHIP IN RECENT YEARS (SEE PAGES 4 & 5).

2. TO DATE 53.6% OF THE LABOR AND OVERHEAD BUDGET HAS BEEN EXPENDED. AS A MEANS OF RELATING ACTUAL LABOR EXPENDITURES TO ACTUAL SHIP PROGRESS THE FOLLOWING COMPARISIONS ARE PROVIDED.

   A. PROJECTED LABOR PROGRESS THRU 11/24/73 IS 60%. ACTUAL PROGRESS IS 40.0%.

   B. B/M COMPLETIONS ARE 900 OF A TOTAL OF 4,490 IN THE MASTER (20.04%) 1,628 ARE ACTIVE. GROUP COMPLETIONS ARE 85 OF A TOTAL OF 3,369 IN THE MASTER (2.52%).

   C.

	Closed Out Work Authorization Manhour Budgets	Manhours Expended	Month's Increment	Cumulative Performance To Budget
Aug.	---	---	---	134.0%
Sept.	266,507	367,572		137.9%
Oct.	289,195	403,937	160.3%	139.7%
Nov.	317,536	456,894	186.9%	143.9%

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SSN 690 - KEY INDICATORS STATUS

I. CTC ANALYSIS (NOV) (IN DOLLARS, 000's OMITTED)

	NOVEMBER ACTUALS	NOVEMBER C.T.C.	VARIANCE (OVER)/UNDER
LABOR	1,045.1	860.9	(184.2)
O/H	1,193.9	951.3	(242.6)
MATERIAL	794.2	N.A.	N.A.
TOTAL	3,033.2		

II. CTC ANALYSIS (AT COMPL.)

	INCURRED	CTC REMAINING	ADJ.CAC.	4TH Q.TOT.	SEPT. OCT. NOV. CUM.VAR.(OVER)/UNDER	BUDGET	ADJ. C.T.C. (OVER)/UNDER*
LABOR	12,921.4	16,542.9	29,464.3	29,331.3	(153.0)	24,805.8	(4,658.5)
O/H	15,207.6	18,512.9	33,720.5	32,741.3	(979.2)	27,685.9	(6,034.
MATERIAL	17,073.8	5,822.1	22,895.9	22,895.9	-0-	20,661.2	(2,234.7)
TOTAL	45,202.8	40,887.9	86,080.7	84,948.5	(1,132.2)	73,152.9	(12,927.8)

III. MAIN CAUSES OF VARIANCE * (000's OMITTED)

		COMMENTS
DIRECT LABOR HOURS	$(5,110.1)	Performance and charging pattern changes.
APPLIED OVERHEAD	(6,025.8)	" " " " "
DIRECT LABOR RATE	59.6	D/L rate underrun of $.0125 x 4746.7 hours = $59.6
MATERIAL	(2,234.7)	Material increase of $2,275.8 due primarily to increased subcontracting and farmout estimates.

*(see page 5 for details)

IV. MANHOURS PER PERCENT OF PROGRESS (S/Y OPERATIONS) - ADJUSTED FOR CHARGING PATTERN CHANGES**

	MONTHLY INCREMENT	CUM. (BUDGET = 42,313)
September 1973	66,483 M/H's/% progress	50,387 M/H's/% progress
October 1973	67,339 M/H's/% progress	51,358 M/H's/% progress
November 1973	91,305 M/H's/% progress	53,156 M/H's/% progress
SSN 637 at Completion		42,220 M/H's/% progress
SSN 650 at Completion		39,221 M/H's/% progress
SSN 678 at Completion		32,218 M/H's/% progress

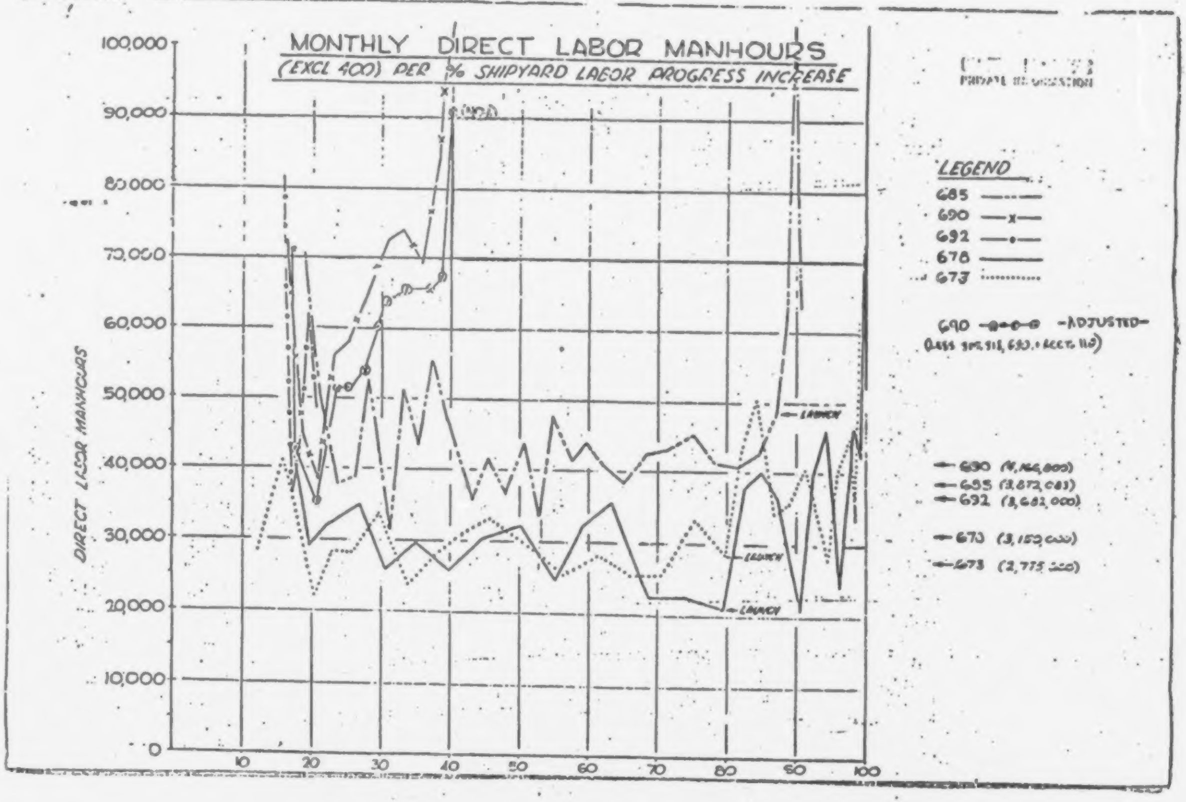
V. COST PER PERCENT OF PROGRESS

$ PER % PROGRESS

	BUDGET	CUM. THRU 10/29	NOV. INCREMENT	CUM. THRU 11/24	4TH QTR. EST. AT COMP.
TOTAL	731,529	828,479	1,372,506	851,117	849,485
GROSS LABOR	248,058	303,071	538,727	314,237	293,113
OVERHEAD	276,859	357,617	615,395	369,836	327,413
MATERIAL	206,612	[illegible]	[illegible]	[illegible]	[illegible],959

**[illegible]

Page 3



MONTHLY DIRECT LABOR MANHOURS

(EXCL 400) PER % SHIPYARD LABOR PROGRESS INCREASE

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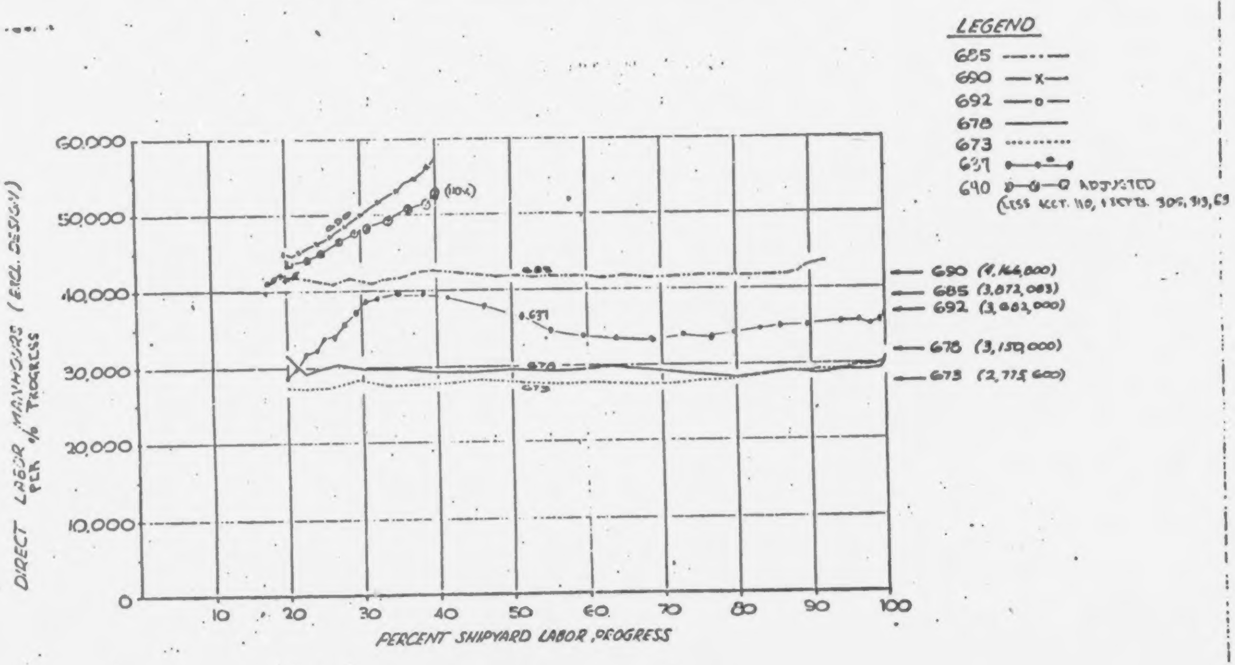
DIRECT LABOR MANHOURS (EXCL. 400's)

PER % SHIPYARD LABOR PROGRESS (CUMULATIVE)



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COST VARIANCE ANALYSIS
NOVEMBER 1973
SSN 690-N00024-71-C-0268

COST FACTORS	BUDGET AS OF 11-24-73	ADJUSTED 4TH QUARTER C.T.C.	VARIANCE ( ) = INCREASE
DIRECT LABOR HOURS	4746.7	5794.7	(1,048.0)
DIRECT LABOR RATES	$4.8886	4.8761	.0125
OVERHEAD RATES	119.3105%	119.3417%	(.0312) %
COST ELEMENTS			
DIRECT LABOR DOLLARS	$23,204.9	$28,255.4	$(5,050.5)
OVERHEAD DOLLARS	27,685.9	33,720.5	(6,034.6)
DIRECT OVERTIME	1,239.2	821.0	418.2
DIRECT SHIFT	361.7	387.9	(26.2)
DIRECT MATERIAL	20,661.2	22,895.9	(2,234.7)
ESTIMATE AT COMPLETION	$73,152.9	$86,080.7	$(12,927.8)*

DIRECT LABOR HOURS	(Increase of 1048.0 @ $4.8761	$(5,110.1)
APPLIED OVERHEAD	@ 119.3105%	(6,096.9)
COST INCREASE DUE TO DIRECT LABOR HOURS		(11,207.0)
DIRECT LABOR RATES	4746.7 HRS. @ $.0125	59.6
APPLIED OVERHEAD	@ 119.3105%	71.1
COST DECREASE DUE TO DIRECT LABOR RATE		130.7
OVERHEAD RATE - INCREASE	(.0312%) x $28,255.4	(8.8)
DIRECT LABOR - OVERTIME DECREASE		418.2
DIRECT LABOR - SHIFT INCREASE		(26.2)
DIRECT MATERIAL		(2,234.7)
TOTAL COST VARIANCE		$(12,927.8)

* Overrun variance of $12,927,800 is understated since the Class budget contains $11,642,000 more in escalation recovery than the 4th Quarter C.T.C. estimate. A portion of this $11,642,000 difference is attributable to SSN 690.

POTENTIAL PROBLEMS

1. THE CUMULATIVE COST PER "AVERAGE" PERCENT OF PROGRESS FOR THE PAST THREE MONTHS CONTINUES TO GROW AS SHOWN.

SEPTEMBER	1973	$819,932
OCTOBER	1973	828,479
NOVEMBER	1973	851,117

CONTINUED GROWTH AT THIS AVERAGE RATE INDICATES A POTENTIAL COST INCREASE OF BETTER THAN 16% PER ANNUM (THRU SEPTEMBER 1974) TO ACCOMPLISH ONE PERCENT PROGRESS. FURTHER, BASED UPON ACTUAL RETURNS AND PROGRESS TO DATE IT IS APPARENT THAT THE C.T.C. WILL CONTINUE TO GROW (SEE ITEM 1, PAGE 2). UNLESS THIS TENDENCY IS REVERSED AND/OR PRODUCTIVITY IMPROVED TO EXCEED SUCH GROWTH OR AT LEAST COINCIDE WITH IT, THE OUTLOOK FOR SSN 690 IS A SIGNIFICANT OVERRUN.

√ 2. LABOR PERFORMANCE TO MANHOUR BUDGETS CONTINUES TO SHOW A DETERIORATING TREND (SEE PAGE 1, ITEM 2.C). WHATEVER THE REASON(S) (PRODUCTIVITY AND MATERIAL DELINQUENCIES ARE THE MOST FREQUENTLY MENTIONED) THERE IS NO DOUBT THAT SUCH PERFORMANCE IS A PRIME CONTRIBUTOR TO THE COST GROWTH SHOWN IN ITEM 1 ABOVE AND THE MANHOUR GROWTH SHOWN IN ITEM IV..

3. IT IS RECOMMENDED THAT PROGRAM MANAGEMENT INITIATE A RECOVERY PROGRAM WITH THE LOGICAL STARTING POINT BEING PROGRAM OFFICE REVIEW OF THE UPCOMING 1ST QUARTER 1974 COST TO COMPLETE FORECASTS.

[illegible]
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GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

17

TO: Messrs. M. C. Curtis and
J. D. Pierce

Date: January 14, 1974

FROM: Z. Henry Hyman

FILE NO.:

SUBJECT: SSN688 Class Construction Program - Contract NObs 0268 - Projected Cost at Completion

REFERENCE

Enclosures:
(1) Order of Magnitude Profit & Loss - Based on Current Estimate
(2) SSN688 Class - 1st Flight - Current Expenditures
(3) SSN688 Class - 1st Flight - Estimated Cost at Completion (Total Division)
(4) SSN688 Class - 1st Flight - Comparison of Basic Budget and Revised Budget
(5) SSN690 - Comparison of Current Estimate and 4th Quarter 1973 CTC
(6) SSN688 Class - 1st Flight - Current Estimate of Cost at Completion - Shipyard/Machine Shop
(7) SSN690 - Current Estimate of Cost at Completion & Current Expenditures - Shipyard/Machine Shop
(8) SSN688 Class - 2nd Flight Estimate
(9) Electric Boat Division Historical Overhead HeadCount

Background

At the present time, studies are being accomplished by the following groups to establish the projected cost at completion for the subject contract:

(a) The Corporate Office at the request of Mr. D. S. Lewis.

(b) Arthur Andersen & Company as a part of their review of the Electric Boat Division's profit forecast.

(c) Industrial Engineering under the direction of Dr. D. A. Goldstein at the request of Mr. M. C. Curtis

(d) Cost Engineering/Financial Analysis at the request of the SSN688 Class Program Office.

To date, the only study that has been completed that I have seen is the study accomplished by Cost Engineering/Financial Analysis. I have however participated in discussions with both Dr. D. A. Goldstein and Mr. R. K. Gregory on the study being accomplished by Industrial Engineering. I expect this study to be completed the early part of this week.

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EB 442 REV 12/66

Summary

Enclosures (1) through (9) represents the results of the study accomplished by Cost Engineering/Financial Analysis and their assessment of this contract. This assessment will be discussed in detail in conjunction with any required explanation of the enclosures.

As you can see, enclosures (1) through (9) presents a very bleak picture. It is important, however, for you to realize that this is essentially the same picture that was presented in May and June of 1973 as part of the 2nd Flight estimate review. This realization must be emphasized and re-emphasized because after having had a potential problem identified, we, as a Company, chose a course of action that assumed that we could overcome the problem and realize a successful program both in performance and cost. I previously concurred in this course of action and today re-affirm that concurrence.

As I indicated, there are four studies being accomplished. While the study accomplishe by Cost Engineering/Financial Analysis is the only one completed, that I have seen, I am convinced that all of the studies when completed will not differ significantly from each other. Therefore, an assessment of the problems based on the Cost Engineering/Financial Analysis study is considered worthwhile at this time in order to establish some quantification of the problem.

I recommend that as the other studies are completed, that a comparison be made in order to refine the magnitude of the problem. In any case, the corrective action required, in my opinion, will not be significantly affected by differences in the results of the studies.

The enclosures for the most part are self-explanatory. However, where necessary, clarifying explanations will be provided.

The format of the enclosures are such that an assessment is possible of the identified problems. I believe that a careful review of each of the enclosures will make the implications of each of the enclosures quite clear. The areas that in my opinion are of special significance are as follows:

(a) The major impact is the apparent scope growth and supervisory transfer to direct charging. (The Supervisory impact is approaching 10%).

(b) The analysis assumes (and correctly so) that problems experienced on the SSN690 will not be transmitted to follow-ships.

(c) The analysis assumes that an assessment is made of production techniques, as utilized on the SSN690 and where possible, positive action is taken to prevent recurrence.

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(d) The analysis assumes that the deterioration in our performance caused by new hires does not exceed current levels and at some point within the next year or year and a half, it improves.

(e) The analysis does not reflect any savings to be realized from Productivity Programs that have been and are being planned for implementation.

(f) The analysis is optimistic about the ability of the Division to minimize the impact of the identified problems.

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Discussion

✓ The fact that we are faced with problems is not news. Early identification of this fact resulted from the efforts associated with the development of the estimate for the 2nd flight of ships. Early identification of our problems has to be considered an advantage. To date we have only expended approximately 17% of the total manhours in the original basic estimated manhours.

The task we face is an improvement in performance. To meet the 1974 Plan, we must reduce the projected manhour expenditures by approximately 4,500,000 manhours, if the Cost Engineering/Financial Analysis estimate for the cost-at-completion is used as the base. This task may be different when the other study results are available; however, as indicated previously, I do not believe that the magnitude of the task is going to vary significantly. Improvement in the material area is also going to be necessary, particularly with regard to our subcontract and farmout programs.

✓ I am not yet ready to throw in the sponge and admit that disaster has to be a reality. I am convinced that there are others throughout Electric Boat Division of the same mind. I am, however, firmly convinced that now has to be the time. Time is creeping up on us day by day. Promises of the future have to be realities of today. The program must be turned around now!

Suggestions For Improvement

I have attempted to be objective in assessing the analysis provided by Cost Engineering/Financial Analysis. In doing so, various suggestions for improvements came to my mind. I am positive, that when collectively the entire Division addresses itself to our problem, that many more and probably better suggestions will surface. The suggestions that come immediately to my mind are as follows:

(a) There must be a change in attitude towards the SSN688 Class Program. We must recognize that we are fighting for our existence. If we do not solve this problem in the next year, some of our present management will be unemployed and those remaining will spend the next eight years fighting for their lives. When one considers the potential profit contribution of the SSN688 Class program to the Division's and Corporation's overall profit, we must be No. 1, and not 2nd, 3rd or 4th. How this message is communicated by you to your staff, and they to their respective subordinates, is one of the most pressing questions facing us.

(b) There has to be a reduction in the number of learners assigned and working on the SSN688 Class Program. This should not be a goal for the future, but there must be a positive program implemented immediately to change the balance of skill-mix ratios throughout the shipyard in favor of the SSN688 Class Program.

(c) Scope reduction actions such as the Producibility and Design Improvement programs must be expanded. The results of pending discussions between NAVSHIPS and the SSN688 Class Program Office have to be carefully evaluated to determine the course of action for Electric Boat Division. Indications are that the Design Agent (Newport News) may not be able to, or may not want to, respond so that Electric Boat Division can realize the maximum benefits from these programs. It may be necessary to implement these programs within Electric Boat Division. This decision, however, must be based on firm data as regards real savings, rather than just a desire to do it the Electric Boat way.

(d) Industrial Engineering efforts must be concentrated on that activity for which it was established initially, namely, reducing costs. Those areas that come to my mind are as follows:

(1) Assure maximum utilization of automatic equipment.

(2) Implementation of those ideas that have been proven their effectiveness such as crew loading and where possible expand these concepts. What was accomplished in two weeks by crew loading on the cylinders used for the keel laying of the SSN696 is an example of what can be accomplished.

(3) Continue and expand improvements in setting up a production capability throughout Electric Boat Division for three SSN688's a year. This capability is mandatory if we are going to come anywhere close t the present schedules for the 2nd Flight.

(e) A schedule must be developed and issued immediately to the shipyard for guidance and direction of their production efforts. Without a schedule, the shipyard is hampered in their efforts to effectively allocate their available manpower resources. The schedule must be the tightest possibl without being hopeless to achieve by the shipyard.

(f) A positive manpower control plan should be developed. Manpower should assigned to the SSN688 Class program by name, rank and serial number. a program would facilitate checking to insure that the right people are assigned and retained on the program. The development of teams of people is mandatory to insure a smooth transition from ship to ship and also to insure that shipboard problems are not repeated on each ship.

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(g) Most frequently, shipyard manhour improvements are discussed. Recognizing the magnitude of our problem, I feel that a close look has to be made of all SSN688 Class manhours. Over 20% of the total manhours that will be expended will be expended by departments other than the shipyard.

(h) The present procedures in effect for evaluating the impact of changes initiated by the Design Agent (Newport News) should be carefully reviewed to insure that Electric Boat Division realizes the maximum price adjustment for each change. Additionally, a plan should be developed to insure that the proper groundwork is established to support any "claim" action that may be appropriate for Electric Boat Division to initiate. I have an outline for such a plan that I intend to discuss with you in the next week or so.

(i) A realistic assessment is necessary for all of the Productivity Improvement and other improvement programs contemplated and these savings reflected in all of the study results. For the past year, the cost-to-complete forecasts have only increased. Identification of improvement programs, resulted in the increased manhours to implement and manage the program, but little or no savings reflected in the cost-at-completion of the SSN688 Class Program.

I have to admit that for the most part the above suggestions have been talked about before and are not new. This fact, however, does not diminish the need for implementing these suggestions nor any others that are developed as we look closer at our problem. It is noteworthy to me that there does not appear to be any one single action which will solve the problem. The problem can only be solved by reducing costs wherever we can in everything that we do on the SSN688 Class program.

Last but not least is our overhead costs. A review of enclosure (9) indicates that an expansion of overhead headcount can be realized without exceeding the established overhead ceiling level. It be must clearly understood by all, that overhead costs can adversely impact the SSN688 Class Program. Discipline must be exercised to insure that overhead costs are not allowed to become a problem during 1974 and subsequent years.

Z. Henry Hyman
SSN688 Class Program Manager

ZHH:MR

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ORDER OF MAGNITUDE P&L BASED ON CURRENT ESTIMATE

			HOURS			
Basic Bid 7 Ships Estimated Cost			27,039			$452,758
Supervision			2,093			
Scope Increase			2,201	4,571	$49,924	
Potential Productivity			1,777			
Farmout			(1,500)			
			31,610			
Rate						
Overhead	116.4%	118.0%			(7,828)	
Direct Labor	$5.18	$5.01				
Shift & Overtime					(2,739)	
Material Cost Increases						
Farmout					16,383	
Farmout Premiums						
Spent		$4,813				
Forecast		3,187			18,466	
Other Overrun						
Spent		$4,095				
Forecast		6,371				
SUB-TOTAL						$ 74,206
TOTAL ESTIMATE AT COMPLETION						$526,964
Ceiling Price						$501,548
Profit(Loss)*						$(25,416)

*Does not include any impact of schedule slippage beyond "Tapered Six". An additional 6 month per ship slip would add $13,500,000 to the loss.

Enclosure 1
1-14-74

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SSN688 CLASS 1ST FLIGHT
EXPENDITURES TO DATE

	SPENT AND COMMITTED	TO GO	TOTAL
Labor	$ 21,398	$136,596	$157,994
Overhead	26,823	160,049	186,872
Material	123,120	51,580	174,700
Overtime & Shift	1,081	6,317	7,398
TOTAL	$172,422	$354,542	$526,964
HOURS	4,612	26,998	31,610

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Enclosure 2
1-14-74

Cost at Completion First Flight 688

Total Division Hours (X 1000)

	Cost Engineering	1974 Plan
Shipyard/Machine Shop	27,611.5	22,464.5
Subcontract	(1,500.0)	(2,200.0)
STO	(270.9)	-0-
Welding Engineering	-0-	(113.5)
Total	25,840.6	20,151.0
Procurement	143.1	188.9
Production Control	168.6	168.6
NCR	536.0	536.0
NQC	500.8	500.8
Maintenance	77.8	77.8
Industrial Engineering	333.5	333.5
WAC	344.5	380.5
Engineering	1,013.0	1,013.0
NED	99.8	99.8
Comptroller	24.0	8.7
Security	104.6	104.6
Program Manager	50.4	50.4
RADCON	108.5	72.3
Material Control	350.4	368.0
Planning	300.5	360.5
Welding Engineering	99.8	113.5
QC	1,413.8	1,467.2
Subcontract Administration	100.5	-0-
Miscellaneous Charges		1.2
Sub Total	31,610.2	25,996.3
Contracts	-0-	60.6
Total	31,610.2	26,056.9

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Enclosure 3
1/14/74

[illegible] CONTAINS [illegible] FINANCIAL [illegible] AND IS PRIVILEGED [illegible] EXEMPT FROM DISCLOSURE UNDER THE PROVISIONS OF THE FREEDOM OF INFORMATION ACT AND/OR OTHER APPLICABLE STATUTES. IT IS SUBMITTED ON THE CONDITION THAT ITS CONTENTS WILL NOT BE RELEASED WITHOUT PRIOR WRITTEN NOTICE TO GENERAL DYNAMICS CORPORATION.

SSN688's Construction Program N00024-71-C-0268
SSN690, 692, 694, 696, 697, 698, 699

(000's)

		Original Basic Budget	Adjustments	Revised Budget	4th Quarter 1973 Hours at Completion	Variance (Over) Under	Actuals Thru Nov. 19[illegible]
E01	Machine Shop	1,767.0			1,074.1		394.6
E02	Shipyard	20,398.3			19,190.4		2,819.3
	Sub Total	22,165.3	1,477.3	23,642.6	20,264.5	3,378.1	3,213.9
E07	Production Control				549.1		
E29	Material Control				368.0		
E32	Planning				360.5		
	Sub Total	863.9	61.4	925.3	1,277.6	(352.3)	394
E08	Management Engineering	-	-		.1	(.1)	[illegible]
E18	Industrial Relations	125.0	-	125.0	104.6	20.4	4.1
E12	Maintenance & Construction	77.7	1.5	79.2	78.7	.5	19.4
E05	Procurement	-	-	-	188.9	(188.9)	59.8
E13	Industrial Engineering	300.0	48.6	348.6	333.5	15.1	125.2
E21	SSN688 Class Program Mgmt.	53.0	(9.7)	43.3	50.4	(7.1)	25.3
E27	Radiological Control	34.8	(3.2)	31.6	72.3	(40.7)	7.1
	Total	23,619.7	1,575.9	25,195.6	22,370.6	2,825.0	3,849.4
E31	Quality Assurance	1,503.2	(7.4)	1,495.8	1,467.2	28.6	336.3
E15	Engineering	982.3	48.6	1,030.9	1,013.0	17.9	151.2
E10	Nuclear Construction & Repair	349.8	12.6	362.4	536.0	(173.6)	24.9
E11	Nuclear Quality Control	471.0	-	471.0	500.8	(29.8)	128.7
E16	Nuclear Engineering & Design	102.6	3.1	105.7	99.8	5.9	59.7
E23	Contracts	10.5	-	10.5	60.6	(50.1)	60.0
E37	Program Mgr. Reserve	-	(61.0)	(61.0)	1,951.6	(2,012.6)	-
E17	Comptroller	-	8.8	8.8	8.7	.1	.7
	All Other		-		.2	(.2)	1.5
	Sub Total				5,637.9		
	Grand Total	27,039.1	1,580.6	28,619.7	28,008.5	611.2	4,612.4
	Profit Review Adjustments 1974 Plan				(1,952.5)		
	Profit Review Total 1974 Plan			27,119.7	26,056.0 *		

*This is the manhour number used in the 1974 plan which produces $28,894,000 profit

Enclosure 4

Enclosure "4" requires the following explanation:

The adjustments are the results of change orders issued to date and changes to charging patterns such as supervisory transfer to direct charging and functions reassigned between departments. This revised budget has not been adjusted downward for farmout. The enclosure was prepared to ascertain from an estimating point of view what the revised budget should be to make it consistent with the original basic budget. Since the farmout is approximately 1.7 million manhours of Shipyard labor, it can be seen that eliminating the adjustment for the supervisory transfer and the farmout would bring the Shipyard manhour budget in line with the 4th Quarter C-T-C. The reason for pointing this out is that when the supervision was transferred to direct charging, EB stated that this would be accomplished without an increase in the previously issued budgets. This goal is yet to be accomplished.

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1/14/74
Enclosure 4A

Division Comparison for SSN690

	690 Cost Engineering	4th Quarter CTC	Actuals 11/30/73
Shipyard/Machine Shop	4,643.9	3,856.3	1,636.1
Subcontract	(127)	-	-
Sub Total	4,516.9	3,856.3	1,636.1
Procurement	144.6	188.9	59.7
Production Control	31.1	31.1	26.6
NCR	105.2	105.2	23.9
NQC	99.0	99.0	68.6
Maintenance	12.0	12.0	8.3
Industrial Engineering	100.6	100.6	78.2
WAC	281.8	281.8	234.5
Engineering	345.5	345.5	134.9
NED	63.1	63.1	56.5
Comptroller	6.0	2.1	.2
Security	13.6	13.6	3.1
Program Manager	23.9	23.9	21.1
RADCON	15.5	12.3	3.1
Material Control	54.3	52.5	15.7
Planning	63.8	63.8	29.3
Welding Engineering	28.1	-	-
QC	262.0	226.7	130.0
Subcontract Administration	12.7	-	-
Miscellaneous Charges	-	.8	1.0
Reserve	-	250.3	-
Sub Total	6,179.7	5,729.5	2,530.8
Contracts	-	53.6	59.9
Total*	6,179.7	5,783.1	2,590.7

*Unadjusted for farmout.

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Enclosure 5
1/14/74

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Cost at Completion for First Flite 688

Shipyard/Machine Shop Hours (X 1000)

	690	692	694	696	697	698	699	Total
Base Estimate	4,189.2	3,937.8	3,797.9	3,701.6	3,628.7	3,570.0	3,521.6	
Production Problems*	104.0	18.0	13.0	10.0	6.0	6.0	6.0	163
Prorates	112.4							
Sub Total	4,405.6	3,985.8	3,810.9	3,711.6	3,634.7	3,576.0	3,527.6	
Mix Loss	238.3	188.3	175.9	140.7	105.5	70.3	70.3	989.3
Total**	4,643.9	4,144.1	3,986.8	3,852.3	3,740.2	3,646,3	3,597.9	27,611.5
Original Estimate	3,517.3	3,266.3	3,178.4	3,116.7	3,060.2	3,018.7	3,007.7	22,165.3
Variance	1,126.6	877.8	808.4	735.6	680.0	627.6	590.2	5,446.2
Supervisors***					286.1			2,093.0
Scope***					288.4			2,201.1
Mix Loss					105.5			1,152.1

Subcontract has not been removed.

*Production problems were not forecast on work not started in the systems accounts. Problems may well occur as they have on the structural accounts.

**Unadjusted for farmout

***Included in Base Estimate

690 Shipyard/Machine Shop

To Date

	690 Cost Engineering	Spent to Date 11/30/73
Original Estimate	3,517.3	1,251.6
Supervisors	345.2	68.5
Scope	330.3	132.0
Mix Loss - Attrition	238.3	80.0
Production Problems	104.0	104.0
One half Ship Learning	108.8	-0-
Total*	4,643.9	1,636.1

*Unadjusted for farmout

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Enclosure 7

Second Flight 688 Estimate

	699 1st Qtr. 1973 CTC	700 Estimate	699 Cost Engineering	701 Budget
Machine Shop	231.2	246.0		
Shipyard	2,625.9	3,062.5		
Sub Total	2,857.1	3,308.5	3,597.9	3,009.3
August Scope	-	189.3	-	-
Sub Total	2,857.1	3,497.8	3,597.9	3,009.3
Material Control	31.6	32.6	49.3	33.5
Production Control	56.2	186.8	21.9	16.5
WAC			4.9	42.5
Maintenance	10.8	12.8	10.8	12.8
Industrial Engineering	39.9	66.5	30.4	35.3
Engineering	107.1	143.5	106.5	128.9
Procurement	-	87.5	10.0	6.0
NCR	42.4	50.1	70.0	69.1
NQC	63.6	82.5	63.8	87.0
NED	5.8	31.4	5.8	13.5
Security	15.1	32.0	15.1	32.0
Program Manager	3.7	7.0	3.7	5.4
Contracts	1.4	-	-	-
RADCON	9.2	10.4	15.5	10.3
QC	188.4	211.6	208.6	207.5
Planning	12.1	27.1	35.7	12.8
Comptroller	-	-	6.0	5.2
Sub Total	3,444.4	4,479.6	4,255.9	3.727.6
Miscellaneous	-	-	-	50.1
Program Reserve	62.5	-	-	-
Total*	3,506.9	4,479.6	4,255.9	3,777.7

*Unadjusted farmout

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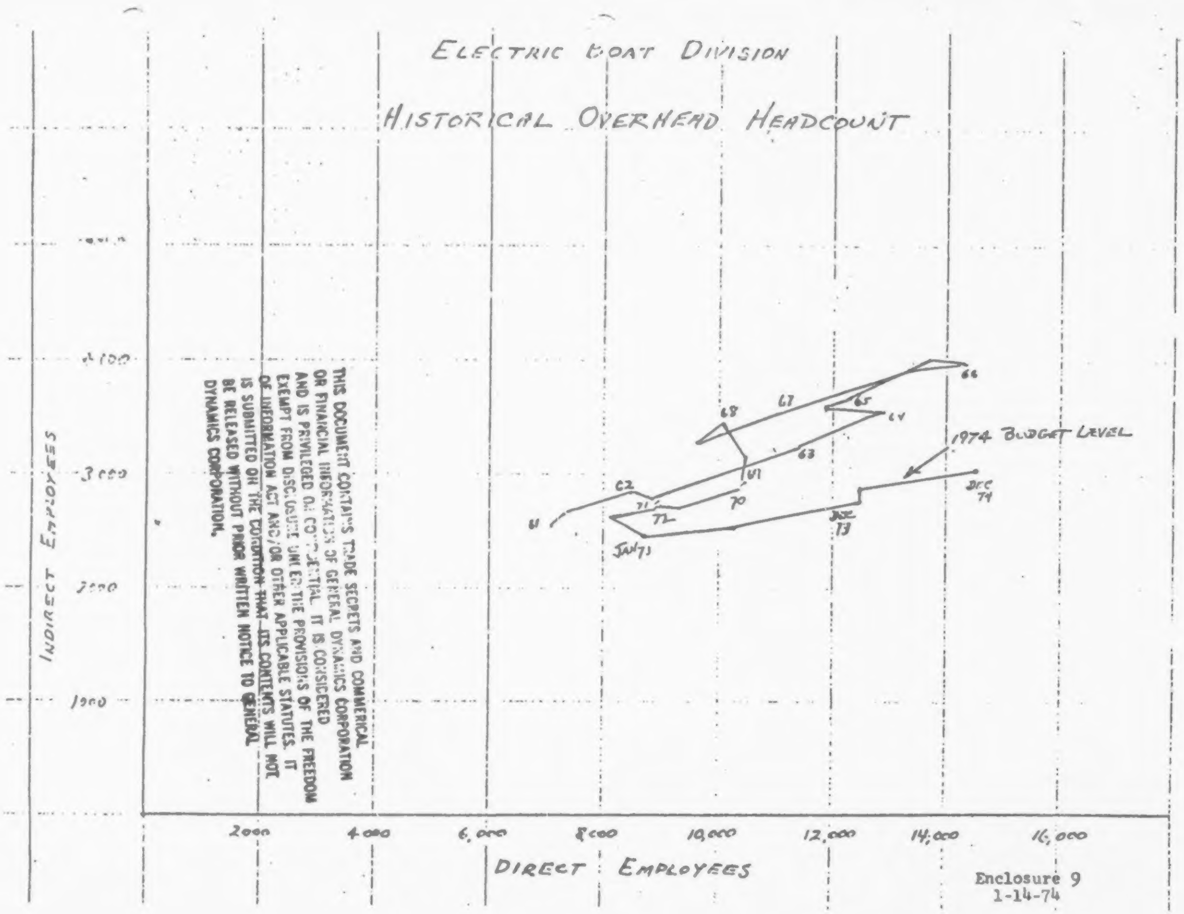
Enclosure 8
1/14/74


ELECTRIC BOAT DIVISION

HISTORICAL OVERHEAD HEADCOUNT

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Enclosure 9
1-14-74

18

H. E. Boyd
15 July 1974 #12

ELECTRIC BOAT PROBLEM AREAS

1. **New Construction**

Trend charts presented to you last week indicate performance has gotten progressively worse during the first half of 1974. This is occurring during a period of all-out cost reduction effort as a result of Corporate review of 1 February 1974.

Review on individual cost saving projects indicates high potential from the pilot programs; however, returns from the various units under construction do not reflect improvements over the long run (repeat units under yard conditions).

This could be caused by:

a. Failure to get acceptance of the item by yard supervision (do the supervisors understand how to implement the program?).

b. Some programs will not adapt to yard conditions.

c. Personnel are being shifted from job to job and not being utilized on repeats of the same operation, thereby eliminating normal learning.

d. Worker attitudes and morale, both in the yard and administrative areas, are not good.

The above are generalities but have been noted in varying degrees on trips to the yard.

2. **Overhauls**

Overhauls that have been in the yard long periods (571, 607, 616 and 619) became behind schedule for various reasons and are not improving although they are receiving maximum management attention. The above overhauls were negotiated during a period of stable manpower and followed a trend of underruns (642 and 656).

Recent overhaul inputs (667 and 671) were approached in a very orderly fashion such as heavy preplanning, early material acquisition and proper loading of the ship upon arrival - getting components out and in the hands of vendors, thereby limiting equipment shortages when reassembling the ships. These two ships are nearing 50% completion and are holding schedule and cost.

585 was approached in a manner similar to 667 and 671, but is a much older ship and only time will tell if the approach will work on all ships.

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7/16 To: P. Lewis
Info! #11
Mep

GENERAL DYNAMICS

INTER-OFFICE MEMO

Memo No. HEB-74-127
10 July 1974

To: Max Golden

From: H. E. Boyd

Subject: Electric Boat Shipyard Performance

Attachments: Performance-To-Targets Charts
January - June 1974

The attached charts (extracted from Electric Boat Shipyard Weekly Management Report dated 29 June 1974) indicate the following:

Performance to Target

1. New Construction (ON THE WAYS): An increase in composite performance from 131% to 142% in the first two quarters of 1974.

2. Overhauls: A performance that has been extremely unstable but following a trend of increasing cost - 144% at the beginning of 1974 to 185% at the June 1974 accounting close-out.

3. Manufacturing (OFF THE WAYS, SHOPS, etc.): Performance has not moved drastically and has shown an improvement of 2% during 1974 (133% in January to 131% in June).

4. Nuclear: Nuclear has shown a downward trend for most of the year resulting in a significant drop (174% to 153% in June).

5. Test: Performance is very unstable on a short run but is trending downward (slightly). The year started at 135% and closed in June at 129%.

Rework

These charts are intended to reflect rework in the various categories.

New construction rework looks normal and is on an improving trend.

Overhaul rework trending down to 4% (or less) is factual using accounting data but does not seem to fit the present situation on overhauls. A comparison of rework charged on SSN-685 and SSN-571, both of which are undergoing essentially the same type work, indicate the following:

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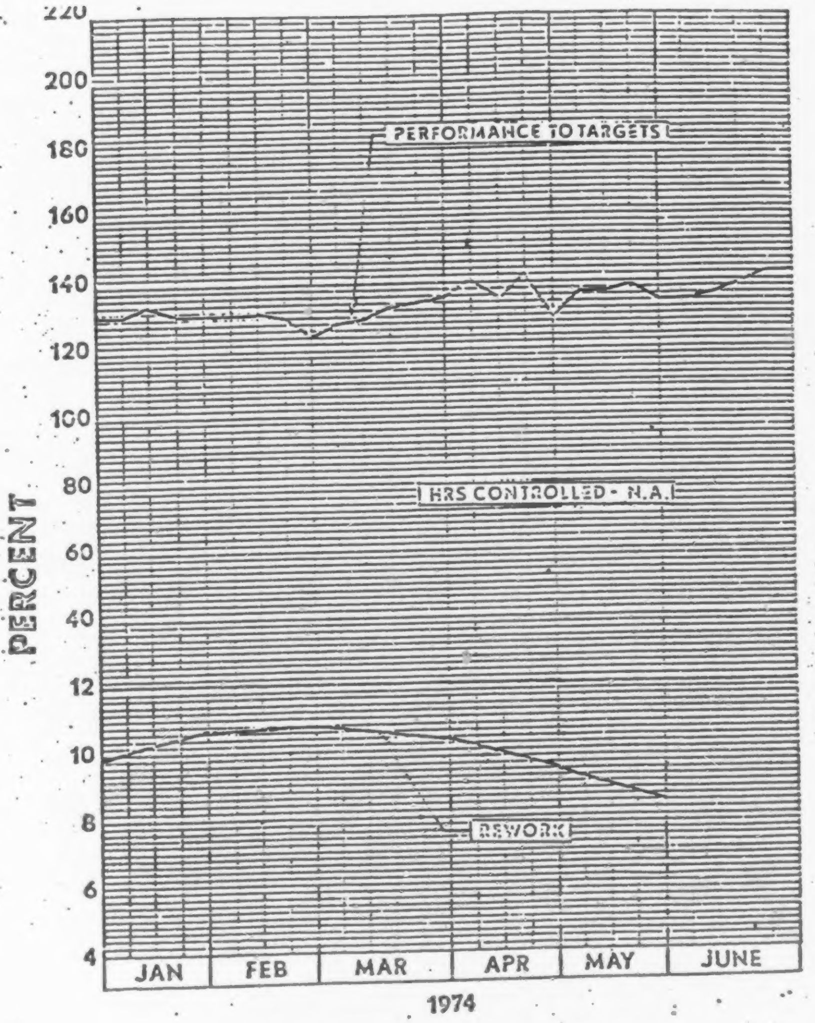

NEW CONSTRUCTION

Direct Charging Non-Supervisory

CHART# 2 Week Ending 6-29-74

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Page 2
Memo No. HEB-74-127
10 July 1974

Rework - contd.

SSN-571	Less than 4% rework.
SSN-685	In excess of 20% rework.

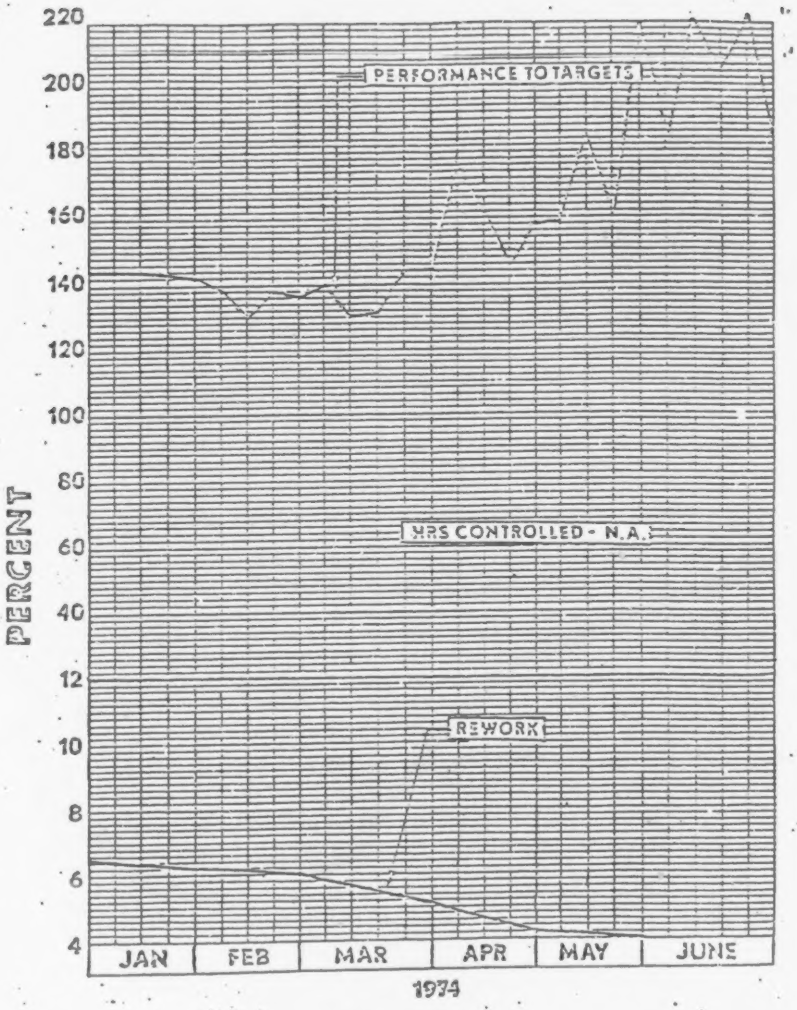
This appears to be a condition in which rework on SSN-571 is being charged to the basic overhaul and not being segregated as a separate entity.

This will be checked our thoroughly on my next trip to Electric Boat.

Homer E. Boyd
Homer E. Boyd

/mec

[illegible] General Dynamics [illegible] ation and is privileged or confidential. It is com[illegible] d exempt from disclosure under the provisions of the Freedom of Informatio[illegible] and/or other applicable statutes. It is submitted on the condition that its contents will not be released without prior written notice to General Dynamics Corporation.



OVERHAUL

Direct Charging Non-Supervisory

CHART # 3 Week Ending 6-29-74

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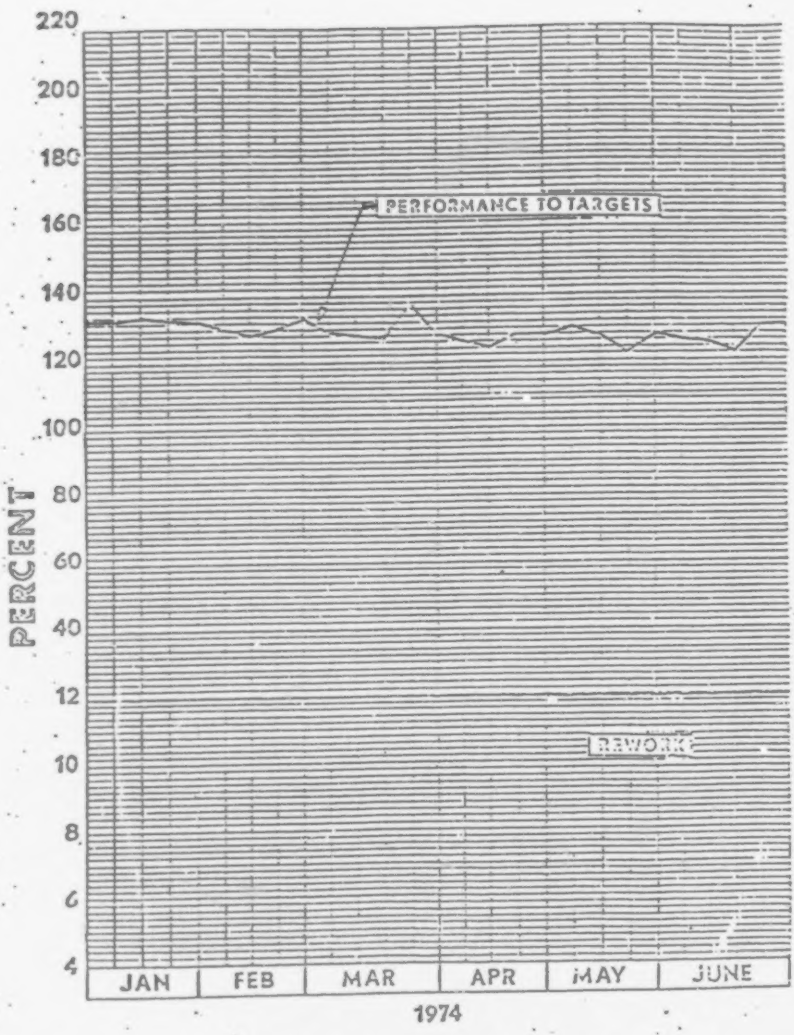

MANUFACTURING

Direct Charging Non-Supervisory

CHART# 4

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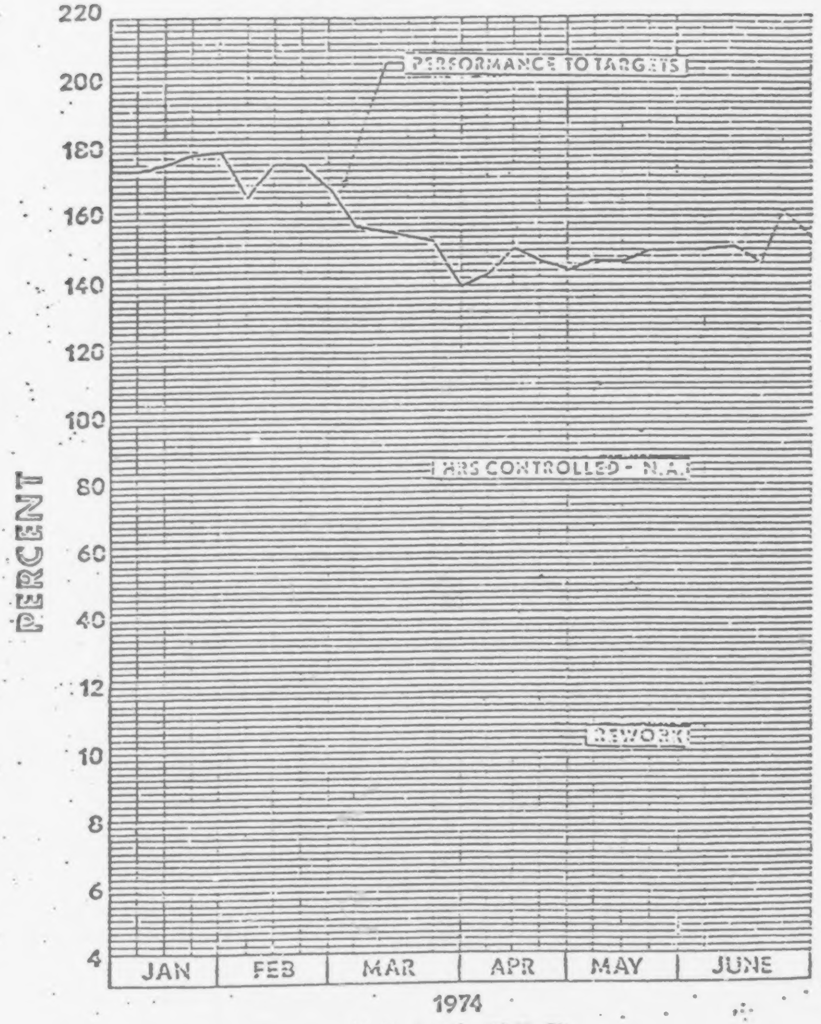

NUCLEAR

Direct Charging Non-Supervisory

CHART # 5 Week Ending 6-29-74

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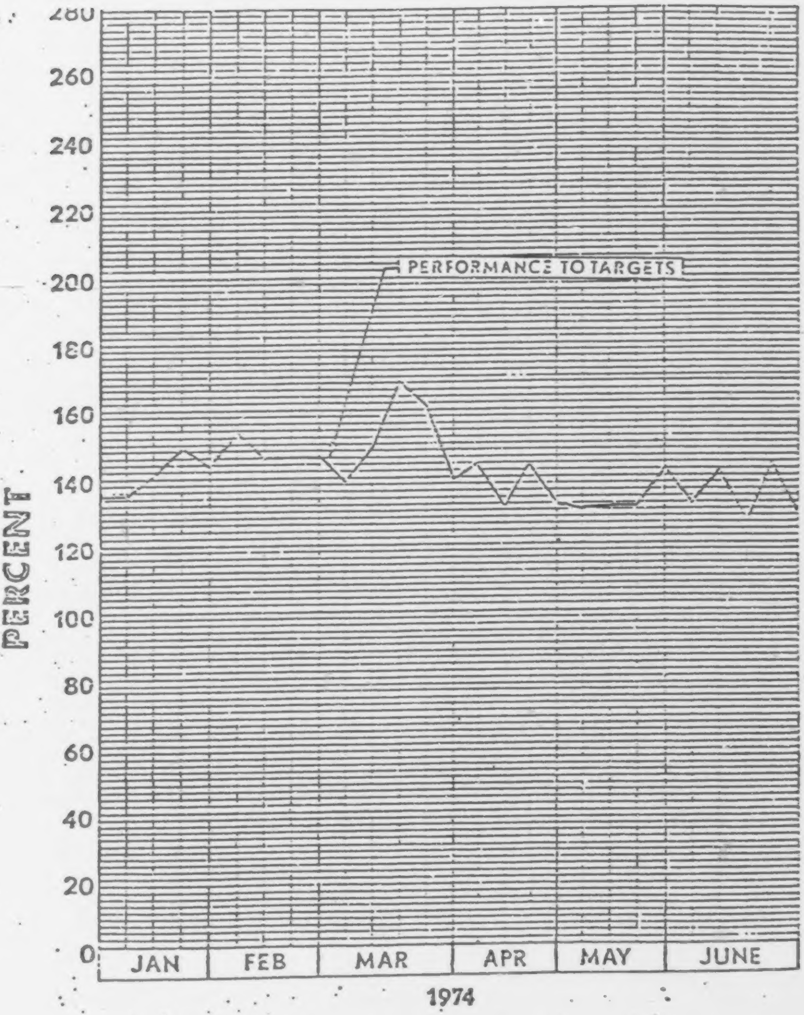

TEST

Direct Charging Non-Supervisory

CHART # 6 Week Ending 6-29-74

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MEMORANDUM FOR THE FILES

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(19)

file 9/c

JULY 30, 1974

SUBJECT: GENERAL DYNAMICS -- ELECTRIC BOAT DIVISION

On Thursday, July 11, 1974, Bill Weldon, Dick Boyle and I visited Electric Boat and met with Art Barton, controller, to be brought up-to-date on the various programs in progress at Electric Boat and the results of operations to date for the year ending December 31, 1974. The major items discussed were as follows:

The 688 Program

We have had serious reservations about how well the Company is going to do on this contract, and therefore convinced them not to book any profit on the contract at December 31, 1973 since based on their current estimates to complete, they would realize a low profit margin. This decision was based on the fact that the contract is a very long (eight years) contract and only a small percentage of work had been performed to date. Also, the lead ship has not been completed and therefore the division did not have any history which they could point to to show that they were going to successfully build these ships.

Art indicated that this program has encountered additional problems during 1974. A guideline he pointed out which they use to measure progress is the number of man-hours required to complete 1% of the ship. He indicated that during 1973 it was taking approximately 120,000 man-hours to complete each percent of the ship. In 1974, this level dropped to about 60,000 man-hours per each percent of physical completion, however, to bring the contract in at a profitable level the man-hours are going to have to be further reduced to approximately 30 to 35,000 man-hours per percent of completion. It should be pointed out that this was the first time Art has indicated to us any negative feeling toward this contract and in the past has always felt that the contract was going to be very profitable and although there appeared to be significant problems on the front end, in the end result these problems would be ironed out. We are starting our preliminary audit at Electric Boat in October for this year's audit and will be looking very closely at this contract and the results to date to determine if a loss reserve is required on this contract.

Overhead Ceiling Agreement

The May, 1974 financial statements indicated the division would overrun their overhead ceiling, which was agreed to in 1972 in a contract with the Navy, by approximately $1.4 million. This ceiling overrun will result in a cost disallowance and therefore these costs would not be collected from the government. Art indicated that they

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have reassessed the overhead position since the May financial statements were issued and in reality the ceiling overrun at a minimum, would be from 3-1/2 to 4 million dollars this year based on the current overhead estimates. He also pointed out that he has had lengthy discussions with the General Dynamics Corporate office concerning this overhead agreement and has indicated to them that unless they renegotiate this contract they could wind up with a potential disallowance of overhead during 1974 of as high as 12 to 13 million dollars. Obviously, this is the outside limit of the disallowance, however, it illustrates the magnitude of the problem for the division. The conclusion reached by the Corporate office and the personnel from Electric Boat was that they will approach the Navy and try to amend the contract to include an escallation clause which will allow them to recover the inflationary factor included in the overhead. Art indicated that these discussions have not started to date, however, they will be in the very near future.

Quons ett Point

During late 1973, Electric Boat started negotiating with the State of Rhode Island to acquire additional space at the Quons ett Point Naval Station in Rhode Island. The negotiations on this space have proceeded very well and Electric Boat currently has personnel at the site constructing components to be shipped down to the shipyard in Groton. The lease negotiated with the State of Rhode Island was very favorable and should be very beneficial to the Division should they be awarded the Trident contract (Trident contract was subsequently awarded to E.B. for $285 million) which will be discussed later. The financing has been nearly solidified and the State of Rhode Island will provide most of the financing. Also, the government is going to furnish a large portion of the machinery and equipment which will be required to manufacture submarine components at that site. This will be very beneficial to Electric Boat since the lead times for new capital equipment are very long. Art appeared to be very pleased with the way things have developed at Quonsett Point.

Financial Results for 1974

From a review of the May financial statements the Division is approximately on budget in regard to sales, however, are significantly under budget at the net income line. This results primarily from additional cost overruns on the overhaul contracts which are CPIF contracts and since the contracts are in an overrun position are at the minimum fee of approximately 2 to 3 percent. Also the costs incurred on the 688 contract have not been up to budgeted amounts, however, this is just a timing difference as to when the cost will be incurred.

It was also noted that contracts in progress have risen significantly and are currently approximately $30 million greater than budgeted. We inquired of Art as to the reason for this significant increase and he indicated that this was primarily due to the physical percentage of completion on the boats not keeping pace with

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the rate that costs are being incurred. Billings are rendered based on physical percentage of completion. [illegible] As was pointed out in our audit at December, 1973, the billing terms are not very favorable on the 688 contract.

Trident Program

The negotiations for the Trident contract have been completed in the last couple of weeks and Art is expecting an announcement that the contract has been awarded to Electric Boat. (Contract for $285 million was awarded during week of July 22nd). Also, Newport News has negotiated for the Trident contract, however, it has been the feeling of people at Electric Boat and also other sources that Newport News was not really interested in building the Trident since they are having significant problems with 688 boats currently under construction. Art indicated the terms of the Trident contract were more favorable than the 688 contract and therefore he would hope that it would be a very profitable contract should it be awarded to Electric Boat. One of the prime factors in negotiating the Trident contract was the fact that Electric Boat has a very significant workload at the current time and was able to take a stronger position with respect to various terms in the contract.

New Regional Data Center

We inquired of Art as to the status of the conversion to the new regional data center which will be located in Groton, and how the conversion from the Univac equipment to the new IBM equipment was progressing. Art said that he was not personally involved in this conversion since this was a Corporate project and Corporate people would be handling all the details. However, he did express concern that they had problems at times with data coming from the computers and sometimes tapes are erased in error or the wrong file is run and they have to recreate data which is needed by the financial department. Dick pointed out that in our EDP-107 review during October 1973, items such as lack of header labels on certain tapes were noted and presumably these problems are being ironed out during the conversion to the new equipment. We also indicated we would be doing another EDP review in connection with this year's audit and would be looking at items of this nature.

Art said that he would investigate to the extent he could to determine why header labels were not used since this directly affected his department and caused long delays for them when errors were made at the data center.

Avenel

During 1974, the financial and operating control of Avenel have been transferred to the Electric Boat Division. Avenel is a plant in New Jersey which manufactures primarily motors for the marine markets. These motors are used in construction of the submarines at Electric Boat and therefore Corporate felt it was appropriate to transfer control of this division to the personnel at Electric Boat. The division has had significant problems in the past, and large loss reserves were set up at the end of 1973 to provide for losses on contracts in-house at that time. Zero gross margin has been booked at this division during 1974, and Art indicated that until they were sure whether the contracts in-house would be profitable, they would not start booking any gross margin. Various people from Electric Boat have visited Avenel to determine what some of the problems are and Roland Plante has been designated to head up the financial reporting of Avenel. The division will be taking a physical inventory probably at the end of August, and we indicated that we would like to observe this inventory and also it would give me a chance to visit the plant and see exactly what the operation is like.

1974 Audit Scope

We told Art that we have been in contact with St. Louis, and they have indicated they want us to do another full audit at Electric Boat this year as opposed to a high-spot review which has been done in some prior years. The scope will be approximately the same as in 1973, however, we will be reevaluating the internal control and the financial reporting of the division and altering our scope accordingly. We also told Art that in connection with this year's audit, we would be using AUDEX and audit through the computer on certain applications rather than around it as we have had to do in the past. Art appeared to be very excited about this and was glad to hear that we would be achieving better control and have more assurance that data was being processed properly by the computer. We briefly explained to Art the concepts of AUDEX and told him we would like to get started at an early date on this project since it was imperative that we understand the processing routines and techniques for the applications we will be looking at. Bill and I had previously discussed this matter and had concluded that we should concentrate our AUDEX work in the payroll area in connection with the 1974 audit since the division has approximately 17,000 to 18,000 employees, and the distribution of this payroll to the various contracts is an extremely complex process. Although we would be starting the audit in October, we would want to get started on the AUDEX applications at an earlier date. Art indicated that we should coordinate the audit with Chuck Kruse, manager of general accounting, and Joe Conti, audit liaison, and that we should also contact Jack Currie, director of corporate internal audit, to arrange to meet with the data processing people and get the AUDEX work started. Roland Plante will be coordinating the effort on Avenel and we should contact him when we determine what our scope should be on that division.

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Bruce M. Prouty
BRUCE M. PROUTY

Addendum:

Upon our return from Groton on July 11, Bill Weldon and I called Terry Lengfelder, audit partner on General Dynamics in St. Louis, and discussed the 688 contract with him and relayed the comments received from Art Barton.

cc: Mr. T. Lengfelder-St.Louis

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TO

MEMORANDUM FOR THE FILES

OFFICE

August 27, 1974

SUBJECT: GENERAL DYNAMICS CORPORATION
ELECTRIC BOAT DIVISION SUMMARY OF OPERATIONS

The Electric Boat Division of General Dynamics Corporation is located in Groton, Connecticut with its prime manufacturing operations also at that location. The Division also has manufacturing operations at Quonset Point, Rhode Island and Avnell, New Jersey although these two locations are not a material portion of the Division's operations. During 1973 the Division received approximately one-third of its revenues from manufacturing new submarines for the U.S. Navy, approximately one-third from overhaul and repair of submarines which have been built either by the Electric Boat Division or other major manufacturers of submarines in the United States and approximately one-third from engineering and design contracts for the U.S. Navy. During 1974 a larger percentage of the Division's revenues will be from new construction contracts because large contracts were received for the manufacture of eighteen (18) 688 class submarines during 1972 and 1973, however, the overhaul program and the engineering contracts will still be an important part of the Division's operations.

The following memo summarizes the Division's operations by the three major lines of business, i.e., new construction, overhaul and engineering contracts.

New Construction Contracts

During the last three years, the Division has had three major new construction contracts. The oldest contract being for the construction of four submarines of the 637 class. This contract for $80,000,000 was a fixed price incentive contract which was substantially completed at the end of 1972 with the last boat being delivered during 1973. The contract terms included a one million dollar delivery incentive per boat for on time delivery. This incentive was earned on all boats.

Another major contract was for one boat of the 685 class, which was a proto-type boat and the only one of its class. The sales price on this contract was $118,000,000. The prime objective in building this boat was to make a super quiet submarine which could not be readily traced underwater. This boat will be delivered

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during late 1974. The contract was a fixed price incentive contract and substantial cost overruns were incurred as a result of cost overruns by a subcontractor on the propulsion unit. Electric Boat was successful in renegotiating the contract terms to receive 100% reimbursement for these overruns by General Electric. Although cost overruns have been incurred on this contract, Electric Boat will still make a profit of approximately $6,000,000 on this contract assuming there are no additional cost overruns.

The largest contract ever awarded to the Division is for the construction of eighteen 688 class submarines. This contract was awarded in two pieces, the fist being awarded during the latter part of 1972 when an award was made for 7 of the submarines and the remaining eleven were awarded during the latter part of 1973. The first boat to be delivered under this contract is scheduled for delivery in June of 1975. Deliveries under this contract will continue to be made until delivery of the eighteenth boat in 1981. The total estimated sell price on this contract is $1,500,000,000 and will represent a significant portion of the Division's volume through 1981. As of December 31, 1972 the Division did not recognize any profit on the 688 contract since the only costs incurred were primarily for materials and only a nominal amount of labor had been incurred. Total estimated direct labor hours on this contract are 60-65,000,000. As of January 1, 1973 the Division started recognizing profit on this contract on the percentage of completion basis and as of December 31, 1973 had recognized approximately $6,000,000 of profit. When AA&Co. performed the audit as of December 31, 1973, it was evident that the contract was not progressing as well as the Division had planned. The Division was still projecting a profit on the contract, however, the estimated profit at completion had declined from the prior year and also the Division was not making the progress they had hoped for on this ship. Because the Division was not making the progress originally planned and when looked at in total, the progress was still limited with the following percentages of completion in each of the areas - Material (%), Labor (%) and Overhead (%), we felt it would be prudent not to recognize any profit on this contract for the year ending December 31, 1973, however, we did agree that assuming the contract appeared to be in a profitable position as of December 31, 1974 the gross margin could be recognized over the remaining life of the contract starting on January 1, 1974. Sufficient progress should be made on the lead ship by December 31, 1974 to give a good indication of how well the Division is going to do on the contract.

The 688 contract is a cost plus incentive contract with 70/30 shareline, i.e., any overruns over the estimated target cost will be shared with the Navy on an 70/30 basis, Electric Boat receiving 70% reimbursement for these cost overruns up to the ceiling cost, any overruns in excess of the ceiling cost will be absorbed 100% by Electric Boat.

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In July of 1974, we met with Art Barton, Controller of Electric Boat Division, to discuss the progress being made on the 688 contract and he indicated the work was not progressing as well as planned and that the Division still had to significantly improve their performance if the Division was going to make a reasonable return on this contract. One indicator that the Division is not progressing according to plan on this contract is that the balance of government contracts in progress on the balance sheet is approximately $30 million dollars greater than the original budgeted amount as of June 30, 1974. This significant increase over the budgeted amount for government contracts in progress results from the physical percentage of completion on the contracts not keeping pace with the rate of cost incurrence on the contract. Billings are rendered to the government based on the physical percentage of completion and not in relation to the actual rate that costs are incurred.

The Division started recognizing profit on this contract on January 1, 1974 and has continued to recognize profit on a percentage of completion basis throughout the year. Total estimated profit to be recognized for this contract for the year 1974 is approximately $9,000,000. AA&Co. will be reviewing this contract very closely to determine if it is prudent to recognize profit at December 31, 1974 based on the progress that is being made on the contract and total estimated costs to be incurred.

During July of 1974 the Division was also awarded a major contract for $285 million to construct the lead ship of the Trident class of submarines. This submarine will be a super quiet submarine and will be approximately double the size of the submarines of the 688 class. The 688 class was already substantially larger than any previous submarine built by the U.S. The terms of the Trident contract are considered much better than the 688 contract because they provide for better progress payments and also the spread between the target costs and the maximum allowable costs or ceiling costs is greater. However, the contract is still a Cost Plus Incentive contract and if the Division overruns the target costs by a substantial amount, they could also have a problem on this contract. Construction on this contract is just starting as of July 31, 1974 and the only costs incurred to date have been for materials with long lead times which the Division acquired because they were almost assured of receiving the contract.

Overhaul Program

The overhaul program represents major overhauls to submarines after they have been in use for a specific number of hours and prior to 1973, the submarine overhaul program at Electric Boat had been very profitable for the Division. The boats are brought into the yard and given a complete overhaul which restores them to "like new" condition. These contracts are cost plus incentive fee contracts and therefore the Division cannot lose money on them unless the cost disallowances exceed the minimum fee (usually three or four percent) spelled out in the contract. Although the Division is practically guaranteed of making at least a minor profit on these contracts, the return on investment is very poor if these contracts are at the minimum fee less any cost disallowances.

These overhauls usually take from one to two years and four boats can be overhauled at one time. It is an exceptional case when an overhaul takes an excess of two years. Although the Division has realized very good rates of return on these contracts priot to 1973, the program had a significant downturn during 1973 and now the Division is struggling to stay above the minimum fee on these contracts. A further discussion of these problems will be made in the problems section of this memo. The Division is almost assured of continued work in the overhaul area since with the large number of submarines currently in the U.S. Fleet there is barely enough capacity in the shipyards throughout the country to handle the overhaul work.

Engineering Contracts

In addition to the new construction and overhaul contracts the Division receives from the Navy, they also receive many contracts from the Navy for design of new submarines and new components to be used in submarines. These contracts are usually cost plus fixed fee and therefore the Division is assured of making a profit on these contracts unless the cost disallowances exceed the fixed fee to be received on the contract. The Division should continue to receive substantial work in the engineering area since they have a major pool of very experienced engineers and apparently do very good work in this area for the Navy.

Problems of the Division

The major problem of the Division at this time has to be the 688 contract and the uncertainties surrounding whether the Division will be able to make a profit on the contract. When the contract was negotiated the Division did not have a large backlog and therefore accepted certain terms which were not as favorable as on prior contracts. For example, the scheduled payments by the Navy were not as favorable as in prior years thus resulting in a larger portion of the Division's capital being tied up in amounts retained on the contracts. Also, the difference between the target cost and the ceiling cost under the contract was very small and therefore the Division would be absorbing 100% of any costs overruns if the contract was overrun by more than approximately 5%. Another problem with this contract which the Division personnel indicated has been substantially solved was that the design on this boat was done by Newport News and therefore the Division was not working with plans which were developed by their own people. This created problems

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2. The Division accepted contracts on two older submarines and when they started repairing them found them to be in disasterous condition and therefore have tied up the yard and not allowed for normal flow of overhauls into and out of the program. The prime boat which has caused this problem is the Nautilus which was the first nuclear submarine constructed. This boat was originally schedule for delivery during 1973, however, it is still in the yard and will not be delivered until at least late 1974. At the present time the Division is transferring some of their best people to the S/P Nautilus contract in an effort to get it out of the yard and let the work start flowing at a normal pace again. As soon as these few overhaul contracts with a low margin and with the big unknown problems are completed, the Division should be able to start earning a reasonable return on the overhaul contracts again.

Overhead Ceiling Agreement

During 1972 Electric Boat entered an agreement with the Navy for the years 1972 through 1975 whereby the amount of overhead which could be applied to contracts would be limited. This was done because the Navy was putting a lot of pressure on the Division to cut overhead expenses since the Division is 100% government contracts and all overhead costs are applied to these contracts. The overhead ceiling agreement limits the overhead based on a given formula which is related to direct labor hours incurred. The Division has not been able to reduce overhead as much as originally anticipated and therefore this agreement will result in substantial cost disallowances starting in 1974 unless the contract can be renegotiated. The estimated cost disallowance under this agreement for 1974 is currently between $3.0 and $3.5 million and could be significantly higher per discussions with Art Barton. The Division is attempting to renegotiate the terms of the agreement with the Navy and hopefully will gain some relief from the contract. The prime factor which has caused costs to exceed the ceiling agreement is inflation. The overhead agreement did not provide a factor for inflation, however, the entire economy is currently experiencing a very rapid increase in cost due to this factor.

Activity Level at the Division

Because of the 688 contract and now the Trident contract, the Division has experienced tremendous pressure from space restrictions since the yard is physically not large enough to handle this substantial increase in workload. A major capital improvement program was started during 1973 and continues into 1974 with estimated expenditures for 1974 of approximately $100 million. This significant increase in activity has caused the Division to increase their work force from approximately 12,000-18,000 personnel and this expansion of the work force has caused many problems as previously indicated in the discussion of the overhaul program. Training costs have gone during the early stages of the lead ship however, these problems appear to have subsided. Another significant factor in this contract which is still unknown is the effects of inflation. The contract has an escalation clause in it whereby materials and labor are escalated based on an index indicated on the contract. This index represents an average for cost increases of shipyards throughout the United States and is time phased over the term of the contract. If the costs of Electric Boat were to increase at the same rate as the average of all other shipyards in the United States and the timing of costs on the contracts were incurred precisely in accordance with the estimate as outlined in the contract, then the Division would not suffer from escalation on the contract except to the extent overhead costs increased. Since there is still a substantial portion of the costs to be incurred, it is not known whether the escalation factors will be a significant item in generating or reducing profit on this contract.

The biggest problem with the contract has been the lack of physical progress on the boats. Art Barton indicated the Division estimated the total man hours per percentage of completion on each boat would have to be reduced to between 30 and 40 thousand man hours. At the present time, the man hours per physical percentage of completion is running at about 60 thousand man hours and unless this number can be reduced, the Division will be in trouble on the contract and could sustain substantial losses. Hopefully, by December 31, 1974 the Division will have made some progress in this area and we will be better able to evaluate the ultimate outcome on the contract.

The problems with the overhaul contracts which have resulted in the substantial decline in profit from these contracts during 1973 and continue to plague the Division during 1974 are as follows:

1. The Division had very good cost experience on the contracts completed during 1972 and therefore when bids were made for contracts to be worked on in 1973 and 1974, they were willing to accept a tighter margin for error since they were confident they could complete the work on these contracts on a timely basis and within the budgeted amount. Certain of these budgets were too tight and the Division has experienced cost overruns on the contracts. The cost overruns resulted not only from the budgets being very tight but the fact that many of the experienced personnel with the Division were taken off the overhaul program and put on the new 688 contract since this was going to be the most significant contract for the Division during the decade of the 70's. Less experienced people were hired to replace the people moved from the overhaul program to the new construction program. It took a great deal of time to train these people and many of them never obtained the productive levels hoped for and had to be let go.

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up and also the pool of skilled workers has practically been depleted. The Division has recently entered a contract with the State of Rhode Island to start manufacturing submarine components at the Quonset Point Naval Air Station in Rhode Island, since that facility was closed by the Navy in recent years. This new facility is currently projecting to utilise between two and five thousand employees and has opened up a new pool of skilled labor for the Division since they can hire the skilled people who worked at the Naval Air Station. The Division is currently transferring people to Quonset Point and is conducting a vigorous hiring campaign to get these people started constructing components to be shipped to Groton and installed in the subs. The substantial increase in volume and the corresponding additional personnel required along with the space restrictions will continue to be a problem for the Division throughout the 1970's.

In summary, the major problems of the Division are:

1. The lack of physical progress on the 688 program and potential cost overruns on the contract

2. The poor performance on the overhaul contracts and the necessity to get this program back on stream and generating profits for the Division

3. The space restrictions

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B M Prouty
BRUCE M. PROUTY

(20)

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7/24/74

TO: J. D. Price

(A)- Material Problems

① Material availability does not support installation schedules in the least – situation not improving

② Shipboard trades unable to ge material commitment dates in most cases – where there are commitments, they're usually missed.

Jo ③ There seems to be complete confusion between Planning/Control, Production Control, and Material Control regarding each other's functions and responsibilities.

④ Expediting of material is done in many cases by trade personnel.

Victor ⑤ Inadequate control of material accountability and movement – no one knows where anything is, and cares even less.

⑥ In many cases material sent to the boat is made wrong, not made at all, or incomplete, resulting in more work for shipboard trades.

(B) Manpower Problems

① The manpower shortage was recognised over a year ago (especially structural welders) and today we still have the same problems — no enough people!

② In some cases the trades ar made up of 65% semi-skilled or untrained people. This has an obviously adverse affect on producti schedules, utilization figures perfo mance returns — can't expect people become competent overnight, and ye the problem is not fully understo by top management.

③ In many cases, new employees not adequately screened for shipya employment — too much emphasis i placed on hiring women as an exampl who are unable to perform competen

④ Manpower (new hires) are assigne either haphazardly or arbitrarily without too much concern for those areas that have an urgent need for people.

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ⓒ Organization Problems

① Shipyard has become so fragmente that decisions must be *made* by ne otiation — no one person or organizatio in charge!

② [illegible]

product lines difficult to achieve - everyone seems concerned about doi their own thing and the hell with everyone else.

③ There seems to be no clear c definition of duties and responsibi ities between the product line orga izations.

④ Because there is no "centralized department" the ability to move peopl from one area to another is retarded everyone's preoccupied with keeping the people they have regardless of where the real need might be.

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GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: J.D. Pierce

Date July 24, 1974

FROM: M. McIntyre

FILE NO.:

SUBJECT: Shipyard Suggestions

REFERENCE:

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1. Job Placement by track record and experience rather than computer pick or selection by educational or social background.

2. Product Line - change or modify to provide beginning to end responsibility by trade. This ensures material getting to ship in time and permits quick adjustment of manpower to suit the greatest need, be it manufacturing at one point, installation the next.

3. Machine Shop- take some action to improve schedule discipline and performance rather than hope it will improve. Farm out those items now for the next ships that held up construction on the 690. i.e. bolted hull valves, in-line valves. Consider merging Production Control and Operations in machine shop under one head; this gives complete control and responsibility to one man, eliminating all excuses.

4. Scheduling- Schedule manufacturing to earliest possible ship need rather than scheduling the ship construction to suit machine shop dates. Early in 688 program, manufacturing was re-scheduled three or four times merely to reduce delinquencies at that point in time. Past management realized years ago that the span from BM completion to Group start should be increased to twelve weeks to insure orderly material handling, grouping and have material ready for ship need. This was done on 37 class programs since then, in the name of lessening delinquencies, this span has been reduced from twelve weeks to eight weeks to four weeks. The result of above makes the ship wait for material and on key items, now the span from shop to ship is one day.

Victor

5. Planning - return trade planning and expediting to the trades. Present planning and expediting is virtually non-existant. Trade planners appear to be restrained from truthful reporting because the truth may reflect badly on other areas of planning or material control.

6. Production Engineering - in many cases a duplication of what Dept. 460 used to do. Place one in each trade department reporting to the trade superintendent for closer cooperation and effective results.

Kose

7. Work Measurement- appears to be a large department duplicating budget department minus thirty percent. In most cases this department made up of people transferred from trades to work measurement because they could not make budget and are now setting targets below budget. If work measurement must exist, place one in each trade department to work closely, in a practical effort with the trade superintendent.

8. Manpower- it would appear that we are manning to a false base or cost to complete rather than manning to ships' need. Very difficult to understand reports of 250 too many welders when ships' need reflects a need for 250 additional welders. Presently, manpower shortage is major in the steel trades; ✓ however, as steel trades improve, I am sure installation manpower needs will become major also.

9. Dept. 460 Design- presently handcuffed by Program Office due to fear of deviating from ND Plans. Best submarine designers in the country have been reduced to clerks writing LAR's to Newport News rather than solving problems and getting jobs moving.

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TO: J.D. PIERC[illegible] [illegible] JULY 23, 1974

FROM: J.J. SA[illegible]

SUBJECT: PROBLEM AREAS NEW CONSTRUCTION

I. COST INFORMATION SSN 688 CLASS [illegible]

A. COST INFORMATION REQUIRED BY OPERATIONS MANAGEMENT TO PROPERLY CONTROL THEIR DEPARTMENTS NOT BEING PROVIDED. DATA NEEDED THAT IS NOT BEING SUPPLIED:

1. CTC PERFORMANCE TO PLAN BY PRODUCT LINE
2. CSWA PERFORMANCE BY PRODUCT LINE
3. GROUP CLOSE OUT PERFORMANCE BY PRODUCT LINE
4. CONTRACT CHANGE INFORMATION EFFECTING DEPT. MANHOURS BY PRODUCT LINE
5. FEED BACK ON TRADE INPUT TO CTC ESTIMATES

B. THE INFORMATION IN "A" ABOVE IS REQUIRED THRU THE DEPARTMENT LEVEL. BEFORE THE PRODUCT LINE SPLIT TOOK PLACE THE ABOVE INFORMATION WAS AVAILABLE AT DIFFERENT PERIODS OF TIME OVER THE PAST FEW YEARS.

C. WHEN THE INFORMATION REQUESTED IN "A" ABOVE IS AVAILABLE, A UNIFORM PROGRAM FOR REVIEW AND ACTION SHOULD BE ESTABLISHED THROUGHOUT THE OPERATIONS DEPARTMENT

D. THE TRANSFER OF WORK FROM ONE PRODUCT LINE TO ANOTHER IS TAKING PLACE WITH NO NOTICABLE CHANGE TO DATE ON ALLOCATED CTC RESPONSIBILITY. DEPT. HEADS MUST ASSUME THERE IS LITTLE COST CONTROL BEING MAINTAINED.

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2 OF 5

E. BUDGETS/TARGETS NOT BEING ASSIGNED TO WORK AUTHORIZATIONS IN A TIMELY MANNER, THE WORK MEASUREMENT PROGRAM IS HELPING FILL THE GAP BUT NOT RESULTING IN THE CONTROL DISCIPLINE REQUIRED AT THE DEPARTMENT LEVEL. APPLIED STANDARDS MUST NOT CONSTANTLY CHANGE, IF RETURN COST DATA ANALYSIS IS TO BE MEANINGFUL FROM SHIP TO SHIP

II. OPERATIONS SUPPORT

A. OPERATIONS MANAGEMENT HAVE NO STAFF WITH THE EXCEPTION OF THE WELDING DEPARTMENT. STAFF WORK IS SUPPLIED FROM SUPPORT DEPARTMENTS SUCH AS TRADE PLANNING, MATERIAL CONTROL, PRODUCTION CONTROL, INDUSTRIAL ENGINEERING, ETC. ✓

B. DEPARTMENT HEADS ARE COMPLAINING THAT THE SERVICES RECEIVED ~~BY~~ FROM THE SUPPORT AREAS ARE NOT ADEQUATE TO MANAGE THEIR WORK. WHEN REQUESTS ARE MADE THEY ARE SLOW TO REACT OR THEY STATE IT IS NOT THEIR JOB. EFFORTS TO IMPROVE THE SERVICE HAVE BEEN UNSUCCESSFUL

C. OPERATIONS SUPPORT DEPARTMENTS THAT ARE ALSO DESIGNED TO CONTROL ARE FAILING IN THAT THEY ARE FREQUENTLY MANNED WITH EMPLOYEES ~~THAT~~ WHO DO NOT KNOW THEIR JOB. WHEN INDIVIDUAL CASES ARE BROUGHT TO THE ATTENTION OF THEIR MANAGEMENT LITTLE ACTION IS TAKEN TO CORRECT THE CONDITION.

D. A POSITIVE ACTION ON THE PART OF TOP MANAGEMENT TO CORRECT THE ITEMS INDICATED IN A, B AND C ABOVE WOULD BE TO RETURN TRADE PLANNING AND MATERIAL EXPEDITING BACK TO OPERATIONS, THIS ACTION WOULD ALSO DEMONSTRATE TO SHIPYARD MANAGEMENT THAT TOP MANAGEMENT HAS CONFIDENCE IN THEIR KNOWLEDGE & ABILITY TO ACCOMPLISH THEIR JOB.

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E. SUPPORT TO OPERATIONS WITH THE DESIGN AGENT AND THE CUSTOMER ON ITEMS THAT HAVE HIGH PAY BACK TO THE DIVISION ARE TOO SLOW AND DO NOT SEAM TO BE APPROACHED WITH A POSITIVE ATTITUDE. TWO PRIME EXAMPLES OF THIS ARE THE CHANGE IN FASTENERS FOR PROPULSION EQUIPMENT WHICH IS NOW APPROVED AND THE BUTT WELD REDUCTION PROGRAM VIA LONG TANGENT FITTINGS AND SOCKET WELDS WHICH IS STILL PENDING. (POTENTIAL SAVINGS IN SEVEN FIGURES.)

III. ORGANIZATION WITHIN OPERATIONS

A. THE PRODUCT LINE SPLIT OF OPERATION MANAGEMENT AND THE TRADES HAS RESULTED IN SOME GOOD AND SOME BAD EFFECTS, AN EFFORT WAS MADE BY THE OPERATIONS DIRECTOR TO CORRECT SOME OF THE PROBLEM AREAS BY A REORGANIZATION WHICH WENT OUTSIDE THE OPERATIONS INTO I.E. PLANNING AND CONTROL, ETC. WITHIN OPERATIONS IT TENDED TO BRING SOME OF THE TRADE BACK TOGETHER WHICH IS A KEY FACTOR IN GETTING MAXIMUM UTILIZATION OF OUR LABOR SKILLS AND ELIMINATED DIVIDED RESPONSIBILITIES FOR PERFORMANCE TO BUDGET AND SCHEDULE

B. THE AREA MANAGER CONCEPT HAS BEEN PROPOSED FOR THE OPERATIONS DEPARTMENT. IF AND WHEN IMPLEMENTED I WOULD STRONGLY RECOMMEND A CONSOLIDATION OF PRODUCT LINES TO THE GREATEST EXTENT POSSIBLE. THE ADVANTAGES FAR OUTWEIGH DISADVANTAGES.

IV. PLANNING & SCHEDULE DISCIPLINE

A. ORIGIONAL SCHEDULES ON SSN 690 APPEAR TO BE BASED ON OTHER THAN SHIP BUILDING REQUIREMENTS. (PLAN RELEASE DATES) RECOVERY SCHEDULES ARE BASED ON MATERIAL AVAILABILITY AND AN ESTIMATED TIME SPAN TO COMPLETE MANUFACTURING. TIME REQUIRED FOR INSTALLATION AND TEST REQUIRES LARGE EXPENDITURES OF OVERTIME AND OVERMANNING IN AN ATTEMPT TO MEET SCHEDULES. WORK SHOULD BE CARRIED AS DELINQUENT AND NOT MOVE THE GOAL POST.

[illegible] OR FINANCIAL INFORMATION [illegible] AND COMMERCIAL AND IS PROPRIETARY TO GENERAL DYNAMICS CORPORATION [illegible] CONFIDENTIAL. IT IS CONSIDERED EXEMPT FROM DISCLOSURE UNDER THE PROVISIONS OF THE FREEDOM OF INFORMATION ACT AND/OR OTHER APPLICABLE STATUTES. IT IS SUBMITTED ON THE CONDITION THAT ITS CONTENTS WILL NOT BE RELEASED WITHOUT PRIOR WRITTEN NOTICE TO GENERAL DYNAMICS CORPORATION.

B. TEST SCHEDULES ON SSN 690 FOR NON-NUCLEAR FLUID SYSTEMS DO NOT EXIST NINE (9) WEEK PRIOR TO LAUNCH. WILL RESULT IN PROBLEM WHEN TIME REQUIRED BY S.T.O. IS NOT AVAILABE TO ACCOMPLISH WORK. IT SHOULD ALSO BE NOTED THAT THERE IS A MAJOR DIFFERENCE IN S.T.O. ORGANIZATION IN THAT THEY NO LONGER WORK FOR THE SAME GENERAL SUPERINTENDENT THAT BUILDS THE SYSTEM. (DIVIDED RESPONSIBILITY)

C. SCHEDULE DICIPLINE IS VERY POOR IN ALL AREAS. THE PROBLEM STARTS WITH LATE RELEASE OF CLEAN PLANS, MATERIAL AVAILABILITY, MANUFACTURING, SUB-ASSEMBLY AND INSTALLATION.
THE MOST SERIOUS AREA EFFECTING INSTALLATION ON BOARD SHIP IS THE MACHINE SHOP. DATES SHOWN ON [illegible] ITEMS ARE CARRIED FOR WEEKS AT A TIME AND NEAR THE DUE DATE IT SLIPS SEVERAL WEEKS. POSITIVE ACTION MUST BE TAKEN TO HELP THE SHOP MEET THEIR SCHEDULE COMMITMENTS IF OTHER AREAS ARE TO PERFORM TO BUDGET AND SCHEDULE.

V. MANPOWER PLANNING

A. THE COORDINATION OF MANPOWER REQUIREMENTS BETWEEN PRODUCT LINES IS POOR RESULTING PROBLEMS ON THE PART OF I.R.D. IN HIRING THE CORRECT NUMBER OF EMPLOYEES BY TRADE.

INFORMATION GIVEN TO MANPOWER PLANNING, DEPT. 627 BY OPERATION DOES NOT GET TO I.R.D. AND CLASSES ARE STARTED. AND LEARNERS RECEIVE THAT CANNOT BE USED EFFECTIVELY. THIS WAS A SERIOUS PROBLEM ABOUT 4-6 MONTHS AGO AND IT IS ABOUT TO HAPPEN AGAIN IF IRD. REFUSES TO LISTEN TO THE DEPARTMENTS THAT KNOW THEIR REQUIREMENTS.

C. MANPOWER PLANNING WAS RELOCATED FROM OPERATIONS TO PLANNING AND CONTROL, IT IS NOT PROVIDING THE SERVICE REQUIRED AND SHOULD BE RETURNED TO OPERATIONS AT THE GENERAL SUPT. LEVEL.

VI. UTILIZATION OF TIME

THE AMOUNT OF TIME SPENT BY MIDDLE MANAGEMENT AT MEETING AND PREPARING FOR MEETINGS DOES NOT GIVE HIM ADEQUATE TIME TO CARRY OUT HIS JOB RESPONSIBILITIES. A REAL EFFORT SHOULD BE MADE BY TOP MANAGEMENT TO CHANGE THIS CONDITION WHICH THEY REALLY HAVE CONTROL OVER.

VII FACILITIES

OPERATIONS DEPENDS ON THREE DIFFERENT DEPARTMENTS FOR FACILITIES AND TOOLING. (666, [illegible] AND 672). NO ONE TAKE THE RESPONSIBILITY TO COORDINATE THE EFFORT OF OPERATIONS WITH THE OTHER TWO. SUGGEST THAT 663 DEPT. TAKE THIS RESPONSIBILITY OR ESTABLISH A FACILITIES AND TOOLING GROUP UNDER OPERATIONS TO SERVICE THE TRADES.

GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: Mr. J. D. Pierce

Date July 23, 1974

FROM: T. Pescatello

FILE NO.:

SUBJECT: Recommendations to Accelerate SSN 688 Program

REFERENCE:

1. Hull Assembly, Hull Erection and Hull Penetrations should be combined into one department under a superintendent who has the experience in these areas, the aggressiveness and decisiveness to run the job and the foresight or planning ability to properly set priorities and sequence the operation. The Hull Superintendent should have direct control over all the trades involved in putting a hull together. He should not have to rely on other product line trades for support because at present there is little cross product line cooperation. There now exists conflicts between Hull Assembly and Hull Erection due to the fact that the Hull Erection Department is tending to lose sight of the boats beyond the SSN 692. SSN 694 and SSN 696 are dying natural deaths because of the lack of foresight in the Hull Erection Department. Completed hull assemblies are just sitting on Ways 8 and 9 waiting for the erection butts to be made. More hull assemblies are being completed with no room on the Ways to land these cylinders. A tour through the SSN 694 would further emphasize the graveyard, rather than shipyard, appearance and performance that exists. What is urgently needed is increased coordination between Hull Assembly and Hull Erection, coordination that can only be found when one superintendent is running the operation. In addition to the increased coordination that would result from the one hull department there would also be increased flexibility and increased effectiveness and utilization of the trades. The superintendent would be able to more effectively crewload high priority jobs. In ordinary terms he would have the ability "to put out the fires" in order to get back into normal operation. The point must be emphasized that the hull superintendent must have the direct control over all the trades (shipfitters, welders, grinders, burners, carpenters and erectors) that are involved in his end product.

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Subject: Recommendations to Accelerate SSN 688 Program

2. Industrial Engineering, Dept. 634, should be eliminated as they serve no constructive function. They have been of no help whatsoever to the Hull Assembly Area. The general consensus of shipyard supervisory personnel concerning these "industrial engineers" is "who needs them?" However, for job security reasons, very few people, if anyone at all, feel that they can . state this fact to higher management. If the function of Department 634 is to measure work and progress then they should have the people qualified to do so. They should not have to rely on the area supervisors to do this work for them. At present the area supervisor must evaluate each of his jobs for these "industrial engineers" and all Department 634 then does is color in the progress and tell the area supervisor how many hours he earned during the past week. It seems that the biggest decision Department 634 has to make each week is what color pencil to use. Department 634 does not support Operations, rather Operations supports Department 634. And Hull Assembly Operations has enough work to support without supporting a non-constructive department. Secondly, Department 634 personnel cause a morale problem within the ranks of shipyard personnel. The trades people notice Department 634 personnel doing practically nothing and getting paid good salaries. Elimination of Department 634 is one of the best cost reduction items available to Electric Boat Division.

3. Production Engineering, Dept. 393, is another department that has been instrumental in employing non-constructive people. Hull construction procedures, which are a product of Department 393, are actually made by Operations people. These hull construction procedures have been in existence since the early sixties and have not changed since. Why do we need these people to generate all their paperwork? We already have enough paper to sink the whole SSN 688 Class.

4. The Planning Departments with their Production Control have been very effective in the quantities of charts, graphs and tables they draw that serve no obvious purpose other than to present at Task Force or Key Events meetings to justify their department's existence. These charts, graphs, etc. are only another thermometer in addition to those thermometers generated by Department 634. We don't need more thermometers to tell us how quickly we're dying; we need hypodermics to get us out of our deathbed. If Production Control is to be of any use it must be under the direction of the area superintendents. We need expeditors to get the materials required by the trades to do their job. Steel, not paperwork and talk, are needed to build ships.

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4. (continued)

Right now all we're getting from the Planning Departments is a high-priced self-criticism with no realistic solutions. No arm-chair quarterback ever won a football game. We have too many administrators and not enough people who get the job done. Too many people are being misused. They are sitting behind desks where they could better be used on the line.

5. The head counter who supposedly measures productivity should be eliminated. This measure is both unfair and unrealistic and is waste of more money. We don't need monitors to tell us to keep busy. We are presently doing the best we can with the resources we have to work with today. A head counter is not going to make any area produce more than it is already producing. If increased productivity is our goal then let us have more people so we can keep them at their job site rather than sending them to other sites where their services are needed and where enroute they are counted as non-productive.

6. In general, the division is over-organized and too complex to work effectively. There are too many "companies" within Electric Boat Division and each "company" is looking out for its own interests. Too many overlaps of effort exist, so really, no one is in charge or accountable.

T. Pescatello

T. Pescatello
Hull Assembly Superintendent

TP/js

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(21)

GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: Mr. J. D. Pierce

Date

FROM: A. M. Barton

FILE NO.:

SUBJECT: Division Profit and Cash Flow Outlook

REFERENCE:

Enclosure: Special Study dated August 2, 1974

Over the past few months, I have become increasingly concerned about our future outlook. Since the profit reviews no longer reflect a realistic forecast of our future, I have prepared a special study of our major contracts to better assess where we stand. The results of the study reinforce my grave concern about our future profit and cash flow situation.

While overhead ceiling overruns and continued poor performance on overhaul contracts are contributing factors, the Division's biggest problem is SSN688 Class construction contract performance. Projected losses on these two contracts exceed $100 million, a profit decline of more than $200 million below the Division's Second Quarter position. The majority of the loss, $84.5 million, is forecast on the SSN690-699 contract while the SSN700-710 contract accounts for another $22.1 million. The primary reason for the profit decline is increased manhours to complete these ships. These contracts were also adversely impacted by higher labor rates due to schedule delays and increased material costs due to inflation.

The impact of this performance on our Cash Flow outlook is equally severe with the cumulative net cash deficit totalling nearly $190 million below the Second Quarter position on these two contracts by 1978.

Now that we know where we stand, the question becomes where do we go from here. The first step in solving any problem is to admit that the problem exists. We must face up to our situation and take major steps to minimize our losses on these contracts. We must take another look at our operation and view every decision in light of its impact on our profitability on these contracts. We can no longer afford the luxury of risking a $100 million loss in order to keep our customer satisfied. Decisions on whether to delay construction of the second contract of SSN688's in order to pursue a "best effort" delivery of Trident must be viewed in terms of the increased SSN700 costs that result from the added construction time as well as the increased ravages of inflation. To aid in this decision-making process, I have examined a number of possible actions to improve our position to determine their impact. These are discussed in a Risk Analysis prepared by Cost Engineering and contained in the SSN688 contract section of this report.

GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: Mr. J. D. Pierce

Date

FROM: A. H. Barton

FILE NO.:

SUBJECT:

REFERENCE:

-2-

The challenge before us is one of monumental proportions. If we are able to rise to the occasion and meet it, we will have taken a giant step toward solidifying the future of our Division and our Corporation.

A. H. Barton

cc: M. C. Curtis

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8/7/74

SSN688 CLASS

Cost Analysis

	Variance	688 I	Variance	688 II
Second Quarter Review		$480,208		$ 894,544
Manhours	$80,024*		$ 92,651*	
Direct Labor Rates	11,541*		73,118*	
Overhead Rates	2,752		(17,396)	
ODC Rate	2,746		1,275	
Shift/Overtime	2,058		3,469	
Material	17,974	117,095	60,319	213,436
Special Study		$597,303		$1,107,980

* Includes Applied OH/ODC

DIRECT LABOR ESTIMATING TECHNIQUE--688 I AND 688 II

I. E01/E02 Manhours

A. Actual returns and progress on substantially completed work (35%)

B. Past performance and weight report, adjusted for current productivity (35%)

C. Account Review using actuals, progress, past projections and judgment (30%)

II. All Other Manhours

A. Manhours that were requested but not included in the Second Quarter Cost to Complete were used

III. Improvement Curve

A. Closed group and BM work on the 690 and 692 were compared (about 50,000 hours)

B. Projections for the steel work for the 690, 692, and 694 were compared

C. Projections for the Class identifying areas for improvement and estimates of the improvement

D. The above techniques indicated a 90% curve was possible on the first seven boats. A judgment that this rate of improvement would not continue on the next eleven but return to the past level of 94% was made

IV. Subcontract

A. 688 I was adjusted for subcontract of 1,983,000 manhours

V. Schedule

A. The delivery of the 690 was projected (3 months slip from the Second Quarter Cost to Complete)

B. The people necessary to delivery three ships per year will not be available until the 696 boat and thus the interval for the 692 and 694 was projected at six months

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V. Schedule (Continued)

  C. After the 696 delivery, delivery for the remaining boats was projected at four-month intervals

VI. Construction on Land-Level Facility

  A. To maintain four-month interval, construction of two boats is necessary on the slab. These were assumed to be the SSN698 and 699

  B. 454,000 manhours were added to the 698 and 699 boats for facility start-up costs. This is consistent with the Trident bid

8/7/74

RISK ANALYSIS

688-I

	Increase Cost (Manhours) X1000	Decrease Cost (Manhours) X1000
E01/E02 Manhour Estimate	4,100	1,200
Improvement Curve	3,000	2,500
Support Area Manhours	1,500	0
Delivery Schedule	500	500
Total Manhours	9,100	4,200
Manhour Dollars	$112,000	$50,000
Delivery Schedule Rate Variance	6,000	6,000
Material Dollars	10,500	5,000
Total Dollars	$128,500	$61,000

688-II

	Increase Cost (Manhours) X1000	Decrease Cost (Manhours) X1000
E01/E02 Manhour Estimate	6,500	1,800
Improvement Curve	6,500	2,500
Support Area Manhours	4,000	1,000
Delivery Schedule	1,500	1,000
Total Manhours	18,500	6,300
Manhour Dollars	$278,000	$95,000
Delivery Schedule Rate Variance	22,000	15,000
Material Dollars	90,400	40,000
Total Dollars	$390,400	$150,000

8/7/74

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OPERATING PROFIT SUMMARY

	1974	1975	1976
Approved Budget	23.0	29.9	45.7
First Quarter Report	22.3	32.9	46.3
Second Quarter Report	17.6	35.2	46.7
Special Study	(34.7)	(2.3)	9.5
SSN688 Class Profit Improvement			
SSN688 I (~~$30M~~ 55 Loss)	~~23.9~~ 36.5	~~12.0~~ 15.5	~~10.1~~ 15.6
SSN688 II (~~$50M~~ 70 Profit)	~~0.9~~ 1.1	~~5.1~~ 6.6	~~9.9~~ 12.7
Elimination of Overhead Ceiling	5.4	1.8	1.0
Potential Outcome	~~4.5~~ 8.3	~~16.6~~ 24.6	~~30.5~~ 39.0

8/8/74

		SPECIAL STUDY		AT NEW PRICING		VARIANCE	
		SALES	PROFIT	SALES	PROFIT	SALES	PROFIT
688 - I	1974	111350	(39254)	147755	(2719)	36535	36535
	1975	119969	(19273)	130035	(1257)	10066	18486
	1976	100920	(11634)	108051	(1083)	7131	15551
688-II	1974	11633	(256)	12764	875	1131	1131
	1975	73133	(1493)	79738	5112	6605	6605
	1976	142493	(2908)	155361	9960	12868	12868

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			ESTIMATE			
	INCEPTION THRU DEC 1973	TOTAL YEAR 1974	TOTAL THRU 1974	TOTAL YEAR 1975	TOTAL YEAR 1976	TOTAL ESTIMATE AT COMPLETION
688-58						
SALES	126906	147785	274691	130035	108051	512777
COST	126906	150504	277410	131322	109134	517866
PROFIT		(2719)	(2719)	(1287)	(1083)	(5089)
RATE						(.98)%
88-						
SALES	890	12764	13654	79737	155361	1,085,861
COST	890	11889	12779	74626	145401	1,016,261
PROFIT		875	875	5111	9960	69600
RATE						6.85%
ES	112484	12916	123400	971	—	124371
T	104659	13757	117816	921	—	118737
FIT	7825	(841)	5584	50	—	5634
RATE						4.74%
USAD						
ES	—	9859	9859	53377	100777	353959
T	—	9023	9023	48852	92233	323950
FIT	—	836	836	4525	8544	30009
RATE						9.26%
[illegible]						
ES	—	—	—	31700	115623	594659
T	—	—	—	28400	103274	574465
PROFIT	—	—	—	3300	12349	95224
RATE						11.63%
A/M						
LES	28473	18705	47178	1548	—	48726
ST	27908	19421	47329	1552	—	48881
OFIT	565	(716)	(151)	(4)	—	(155)
RATE						(.32)%
B/M						
LES	32904	13364	46268	—	—	46268
ST	31729	13911	45640	—	—	45640
OFIT	1175	(547)	628	—	—	628
ATE						1.38%
D/M						
LES	21951	11119	33070	851	—	33921
ST	21534	11642	33176	853	—	34029

SPECIAL REVIEW

- 688 Forecast -

	Cost	Fee	Revenue
N00024-71-C-0268 690/692/694/696-699			
Basic Contract	369,029	43,914	412,943
Adjudicated Change Orders 3/30/74	243	90	333
Total Negotiated	369,272	44,004	413,276
Estimated Change Orders	1,890	192	2,082
Escalation	82,229	-	82,229
Total Authorized	453,391	44,196	497,557
Management Adjustment	-	-	-
Disallowances	9,289	(9,239)	-
Overrun or (Underrun) 70/30	135,017	(119,827)	15,190
Current Indicated Review at Ceiling	~~597,697~~	~~(84,[illegible])~~	512,777
	~~[illegible]~~ 5.7166	~~(30,000)~~ (5089)	
N00024-74-C-0206 SSN's 700-710			
Basic Contract	688,050	81,873	769,923
Adjudicated Change Orders 3/30/74	-	-	-
Total Negotiated	688,050	81,873	769,923
Estimated Change Orders	(133)	65	(68)
Escalation	239,310	-	239,310
Total Authorized	927,227	81,933	1,009,165
Disallowances	6,111 [illegible]	(6,111) (1117)	-
Overrun or (Underrun) 70/30 85/15	~~187,265~~ [illegible]	(111,169) ([illegible])	76,696
Current Indicated Review	~~1,1[illegible],[illegible]03~~	~~(35,[illegible])~~	1,065,661
	~~1035867~~	~~50000~~	
	1016261	69600	

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SSN688 I	Cumulative to Date Through June 1974	Total at Completion		
		Second Quarter 1974 Review	Special Study	Variance
Hours	8,599	26,919	34,077	7,158
Direct Labor Rate	$4.6132	$5.0898	$5.2440	$.1542
Overhead Rate	109.69%	94.23%	96.02%	1.79 %
ODC Rate	12.00%	25.42%	26.93%	1.51 %
Direct Labor Dollars	$ 39,712	$137,012	$ 178,699	$ 41,687
ODC Dollars	4,766	34,826	48,117	13,291
Overhead Dollars	43,560	129,109	171,558	42,479
Overtime/Shift	2,220	6,922	8,980	2,058
Material Dollars	100,926	172,339	190,313	17,974
Total	$191,184	$480,208	$ 597,697	$ 117,489
Profit	$ 3,856 (2)	$ 26,028	$ (84,920)	$(110,948)
Revenue	-	$506,236 (1)	$ 512,777 (1)	$ 6,541
Escalation				
Labor	$ 5,368	$ 59,106	$ 65,433	$ 6,328
Material	14,347	16,582	16,796	214
Total	$ 19,715	$ 75,688	$ 82,229	$ 6,542

SSN688 II	Cumulative to Date Through June 1974	Total at Completion		
		Second Quarter 1974 Review	Special Study	Variance
Hours	51	40,526	47,420	6,894
Direct Labor Rate	$6.2352	$6.2341	$6.9494	$.7153
Overhead Rate	81.76%	84.38%	83.41%	(.97)%
ODC Rate	29.25%	31.20%	31.30%	.10 %
Direct Labor Dollars	$ 318	$252,643	$ 329,539	$ 76,894
ODC Dollars	93	78,825	103,135	24,310
Overhead Dollars	260	213,189	274,856	61,667
Overtime/Shift	5	11,887	15,354	3,467
Material Dollars	4,508	338,000	398,319	60,319
Total	$ 5,184	$894,544	$1,121,203	$ 226,659
Profit	$ 256 (2)	$ 76,031	$ (35,342)	$(111,373)
Revenue	-	$970,575	$1,085,861 (1)	$ 115,286
Escalation				
Labor	$ 86	$147,256	$ 168,391	$ 21,135
Material	3,114	49,881	70,919	21,038
Total	$ 3,200	$197,137	$ 239,310	$ 42,173

(1) At Ceiling
(2) Booked through June 1974

8/7/74

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IMPACT OF CEILING ELIMINATION

- Special Study -

($000's)

	Total at Completion		
	Ceiling Disallowances	Share Ratio	Profit Impact
NEW CONSTRUCTION			
SSN688-I - 0268	6,189	0/100	-
SSN688 II - 0206	509	0/100	-
SSN685 Construction - 0307	649	85/ 15	361
Trident Lead	557	95/ 5	529
Trident Follows	79	70/ 30	56
Other Firm and Likely	110	70/ 30	77
Total New Construction	8,093	13/ 87	1,023
REFUEL, OVERHAUL, CONVERSION			
571/597 Overhaul - 0264	889	100/ 0	889
616 Overhaul - 0277	786	100/ 0	786
607 Second Overhaul - 0255	628	100/ 0	628
619 Overhaul - 0245	982	100/ 0	982
667/671 Overhaul - 0205	889	80/ 20	711
585 Overhaul - 0272	829	100/ 0	829
626 Overhaul - 0261	449	100/ 0	449
Miscellaneous Firm Business	375 }	80/ 20	589
Likely Business	358 }		
Total Refuel, Overhaul, Conversion	6,185	95/ 5	5,863
ENGINEERING	2,440	100/ 0	2,440
LAND BASED PROTOTYPES	186	100/ 0	186
TOTAL DIVISION	16,904	56/ 44	9,512

Ceiling disallowances total disallowances applied to each contract as a result of overruns to the 1973-1975 overhead ceilings.

Profit impact is increase in profit at completion resulting from elimination of overhead ceiling. The share ratio varies according to the cost sharing provisions of our contracts.

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688 I AND 688 I[illegible] COMPANY

	2nd Qtr. Position	Manhours	Schedule	Inflation	Estimated Cost per Special Study	Best Possible Position	Break Even Position
688 I							
nhours SY/MS	21,240.8	6,704.8			27,954.6	23,945.6	21,[illegible].8
Other	5,678.5	452.9			6,131.4	6,131.4	5,600.0
Direct Labor Dollars	137,011.8	36,432.7	4,430.0	824.7	178,699.2	148,523.8	144,958.8
ODC	34,826.7	9,253.9	1,355.6	2,681.0	48,117.2	42,427.7	38,993.9
Overhead	129,108.8	34,319.6	3,827.5	4,332.1	171,588.0	151,414.8	139,160.4
Overtime	4,519.0	1,030.7	146.2	24.7	5,720.6	5,047.2	4,638.7
Shift	2,403.0	655.8	79.7	120.6	3,259.1	2,839.0	2,718.2
Material	172,338.5	0	2,300.0	15,674.5	190,313.0	186,813.0	182,300.0
Total Cost	480,207.8	81,692.7	12,139.0	23,657.6	597,697.1	537,065.5	512,770.0
calation Recovery							
Labor	59,106.0	0	0	6,327.0	65,433.0	65,433.0	65,433.0
Material	16,582.0	0	0	214.0	16,796.0	16,796.0	16,796.0
Escalation Claim	0	0	0	0	0	19,200.0	0
Total	75,688.0	0	0	6,541.0	82,229.0	101,429.0	82,229.0
ntract Ceiling	506,236.0				512,777.0	531,977.0	512,770.0
Profit Position	26,028.2			✓	(84,920.1)	(5,088.5)	0
688 II							
nhours SY/MS	32,042.6	6,796.4			38,839.0	29,139.0	
Other	8,580.6	0			8,580.6	7,580.6	
Direct Labor Dollars	252,642.9	42,266.8	25,132.4	9,497.2	329,539.3	245,964.5	
ODC	78,824.8	13,187.2	7,866.4	3,256.5	103,134.9	79,866.5	
Overhead	213,190.1	35,673.2	20,633.7	5,359.1	274,856.1	212,807.2	
Overtime	7,529.6	1,268.0	728.8	194.1	9,720.5	7,399.8	
Shift	4,356.9	718.5	427.3	132.0	5,634.7	4,337.8	
Material	337,999.9	0	11,100.0	49,219.1	398,319.0	356,919.0	
Total Cost	894,544.2	93,113.7	65,888.6	67,658.0	1,121,204.5	907,294.8	
calation Recovery							
Labor	147,256.0	0	0	21,135.0	168,391.0	168,391.0	
Material	49,881.0	0	0	21,038.0	70,919.0	70,919.0	
Escalation Claim	0	0	0	0	0	38,500.0	
Total	197,137.0			42,173.0	239,310.0	277,810.0	
ntract Ceiling	1,043,917.0				1,085,861.0	1,124,361.0	
Profit Position	76,031.0			✓	(35,343.5)	69,600.0	

BEST POSSIBLE POSITION IS POTENTIAL DECREASE COST PLUS COST IMPROVEMENTS.

		Special Study		At New Position		Variance	
		Sales	Profit	Sales	Profit	Sales	Profit
688-I	1974	111250	(39254)	135163	(15341)	23913	23913
	1975	119969	(19773)	132014	(7728)	12045	12045
	1976	100920	(16634)	111053	(6501)	10133	10133
688-II	1974	11653	(256)	12526	617	873	873
	1975	73133	(1493)	78230	3604	5097	5097
	1976	142493	(2908)	152424	7023	9931	9931

8-2-74

1- – why different base month periods for Trident material escalation vs all other contracts?

What impact would change to April have?

2- – Elimination of Overhead Ceiling as potential profit improvement

3- – Strike

4 – How to boost 688 II workload in 1975 – Quonset?

2 add'l boats or slab? which?

5 – Change overhead ~~words~~ rates writeup to agree with chart

6 688 I/II Total @ completion add expended to date items for each ~~[illegible]~~ item

7 688 I + II Cost Analysis – add escalation to date

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	Special	2nd QTR	Δ
n/t	59,259	58,717	(458)
GFE II	5,116	24,270	(19,154)
R/o/t	36,688	30,761	5927
engr	34,249	34249	—
ste	17,347	17,347	—
total	146,659	160,344	(13,685)

n/t	10,229	
GFE II	978	4660
R/o/t		5559

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GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: J. D. Pierce/M. C. Curtis

Date: August 9, 1974

FROM: A. M. Barton

FILE NO.:

SUBJECT: Division Performance Forecast - Special Study

REFERENCE:

In view of the fact that the current cost to complete forecasts appear to be inaccurate in the projection of costs on both overhaul and new construction contracts, I requested Cost Engineering and Financial Analysis to make a complete analysis of our contracts. The criteria that I established for this analysis was that they utilize current performance data as a basis for projection of future performance and in addition examine the schedules for completion of work as well as current economic conditions. Using these criteria, a projection of contract profit, Division total profit and cash flow was to be developed. The attached special study is the result. It merits careful review.

The summary section of the study contains a synopsis of the situation on the SSN688 program which is the most important program in the Division. It is not a very satisfactory picture. I do not believe that it is inevitable that the financial results indicated in the special study will occur. However, to avoid them we must drastically change our approach to the SSN688 program.

After examining all the data, a very few items stand out as the principal ones that must be addressed in order to avoid substantial losses. These are the potential manhours required to construct the ships, the potential for delay and inflationary costs. There is obviously no simple solution to each of these; however, it seems apparent, particularly in light of the findings of other groups currently investigating this problem, that the following steps must be taken:

1. The shipyard performance must be improved. This improvement cannot be obtained without recognizing that our better tradesmen must be assigned to the SSN688 program. While this is an essential first step, it will not solve the entire problem. It is apparent when looking at the number of people required for the 688 ships that there are not enough skilled people available nor were there ever since 1970, enough skilled people available, to satisfy the requirements of the 688 program. It is interesting to note that while performance in Groton is falling off and this is blamed on new hires, work sent from Groton to Quonset is being performed by new hires at performance levels

substantially better than those at Groton. In spite of all the reasons promulgated to explain this phenomenon, the fact is the work was transferred from Groton to Quonset and had it remained in Groton it would not have been accomplished as efficiently. Apparently there have also been samples of work accomplished at Groton that indicate performance of learners on certain kinds of work not materially different from skilled personnel.

My purpose in mentioning this is to point out that the solution is more illusive than we may be willing to admit. It would appear that the new hire problem is being overplayed. It may just be that a particular size operation (Quonset has approximately 220 tradesmen but one person controls all of the support effort involved in getting the work done) is the optimum unit for production. The recommendations on manpower planning proposed by the Committee strike me as a method of making up for the deficiencies in the organization we have established.

Since those familiar with the yard's performance all seem to agree that the trades are not being properly supervised, we should seek the reason for the individual supervisor's failure instead of adding additional ship managers, areas supervisors and so forth to the management structure.

The special study projects a delay on the second flight and as a consequence indicates no additional hiring requirements until 1976. This situation must be examined not so much to ascertain the schedule situation as the hiring plan. It may well be that until we get Groton performing satisfactorily a respite in the hiring is in order. An accelerated hiring at Quonset to start the steel work on 688's with a corresponding slip in TRIDENT might be a solution. Furthermore, it is apparent that the problem is not an inadequate number of people on the rolls so much as poor productivity. Consequently, an hiatus in hiring while we improve productivity should not impair schedules.

2. Schedules must be maintained. The potential for delay has a substantial affect on costs in that the work is performed at higher rates and certain kinds of material are used later at higher costs when schedules slip. All recognize that in order to keep the entire Division from collapsing, the schedules must be achieved. However, it seems that we are pursuing schedules on TRIDENT that cannot be achieved and consequently are impacting 688's unnecessarily.

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Is it necessary to use the Groton facility on TRIDENT when we are planning to? If we were to delay the utilization of the land level construction facility for TRIDENT enough to enable us to build 2 more 688's on it, would this make any difference in the TRIDENT delivery date that practically can be achieved? Some means must be found to assure that there is pressure taken off the 688 schedule because there is evidence of serious problems. I am not an expert on scheduling but just mandating that we will meet schedules does not make it happen. We must do something that buys us some insurance that the schedules will not slip if all our plans do not materialize in the manner we desire. For example, the Special Study has not evaluated the potential impact of a strike by the MTC in 1975. If one should occur and we have not considered an alternative such as that proposed above, we will lose the schedule.

3. Materials for the SSN688 must be given the highest priority from a procurement standpoint. There are no protections built into the 688 contract in the event we do not buy our materials on schedule as there is in the TRIDENT contract. One of the more serious cost impacts is the estimated inflation cost on materials. Admittedly, the quantification of this is very speculative. Given the consequences we must not hamper our 688 program by expediting the acquisition of TRIDENT material. There is no indication, that we perceive, that such a policy exists.

There is a request in-house from NAVSEA that we procure the long lead material for the follow-on TRIDENT's. It is evident that this will have a serious impact on our suppliers ability to satisfy 688 requirements and the ability of our own Procurement Department to cope with this workload. If we have no choice but to purchase this equipment perhaps we should make it a condition to our proposal that the SSN688-II contract escalation provisions be modified to reflect the delay in acquisition of materials and the supply and demand impact on costs.

4. Priorities: Two examples are included in the special study to demonstrate that we have not yet convinced everybody that the 688's has the highest priority. One is the rate table, page 26, and the other is a recent make versus buy decision which was made over the objection of Cost Engineering, page 25.

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The summary section of the special study indicates what the best possible outcome could be if we find the answers and the estimate is in error on the high side. It may be hopelessly optimistic. If we achieve only 50% of this, our situation may still be acceptable considering the way these contracts have evolved. It must be added that the forecast contained in this study is not the most pessimistic position. The data presented by the committee chaired by Bob Patton indicates a considerably more pessimistic point of view by Industrial Engineering.

I and my staff are prepared to discuss the details behind this analysis at your convenience.

A. M. Barton
Division Comptroller

cc: H. Hyman

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DIVISION PERFORMANCE FORECAST

- Special Study -

August 9, 1974

SPECIAL PROFIT REVIEW STUDY

I. Sales and Earnings Performance
  A. Contract Summary
  B. Division Summary
II. Workload and Rate Forecast
III. SSN688 I and SSN688 II Estimate
IV. SSN688 Risk Analysis
V. Trident Construction
VI. Overhauls--SSN571, SSN607, SSBN616, SSBN619
VII. Other New Construction and Overhaul Contracts
VIII. Cash Flow
IX. Profit Assumptions
X. Summary

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SPECIAL STUDY

Sales and Earning Performance

- Contract -

Total At Completion

Contract	Second Quarter Review			Special Study			Variance		
	Cost	Fee	Revenue	Cost	Fee	Revenue	Cost	Fee	Revenue
685	117,546	5,888	123,434	118,737	5,634	124,371	1,191	(254)	937
688 I	480,208	26,028	506,236	597,697	(84,920)	512,777	117,489	(110,948)	6,541
688 II	894,544	76,031	970,575	1,121,203	(35,342)	1,085,861	226,659	(111,373)	115,286
Trident Construction									
Lead	329,601	24,720	354,321	326,903	29,921	356,824	(2,698)	5,201	2,503
3 Follows	843,951	63,296	907,247	830,444	91,931	922,375	(13,507)	28,635	15,128
571	38,758	453	39,211	48,881	(155)	48,726	10,123	(608)	9,515
607	30,998	219	31,217	34,029	(108)	33,921	3,031	(327)	2,704
616	43,495	978	44,473	45,640	628	46,268	2,145	(350)	1,795
619	44,958	714	45,672	48,615	378	48,993	3,657	(336)	3,321
667/671	33,751	1,458	35,209	39,410	573	39,983	5,659	(885)	4,774
585	34,393	2,236	36,629	40,227	2,520	42,747	5,834	284	6,113
626	40,642	3,048	43,690	47,733	3,044	50,777	7,091	(4)	7,087

- Additional contract information contained in applicable section.
- SSN688 I and SSN688 II profit deterioration due primarily to increased manhours to complete the ships.
- Trident Ship reflects negotiated contract position for special study vs likely business profit rate of 7½% used in Second Quarter Review.
- Overhaul profit decline due to increased disallowances resulting from higher cost at completion and increased overhead ceiling overruns.

SALES AND EARNINGS PERFORMANCE

- Division -

(Millions)

	Sales		
	1974	1975	1976
Approved Budget	462.9	518.0	685.9
First Quarter Report	447.1	572.4	707.3
Second Quarter Report	440.2	614.5	714.1
Special Study	409.3	554.8	663.3

	Operating Profit		
	1974	1975	1976
Approved Budget	23.0	29.9	45.7
First Quarter Report	22.3	32.9	46.3
Second Quarter Report	17.6	35.2	46.7
Special Study	(34.7)	(2.3)	9.5

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WORKLOAD AND RATE FORECAST

The basic direct labor hour workload used for this Special Study was the Second Quarter 1974 Cost to Complete with the following differences and adjustments:

1. Four overhauls were deleted from likely business in order to reflect the Navy's most current tentative assignments to Electric Boat:

		Tentative Arrival Date
a.	SSBN629 Overhaul	January 1976
b.	SSBN631 Overhaul	February 1977
c.	SSN669 Refuel/Overhaul	April 1977
d.	SSN607 Overhaul	March 1978

2. The SSN688's (18 ships) have been rephased to reflect anticipated delays and hours have been increased.
3. The likely SSN688's (1¼ ships per year) have been rephased.
4. The firm overhauls have been adjusted and increased to reflect the latest Division schedule.
5. The workload has been extended, as required, beyond the Second Quarter 1974 Cost to Complete which was generated through the year 1978 only. The extension beyond 1978 was based on the year 1978 level of Overhaul and Engineering activity.

Attached is a reconciliation of the Second Quarter 1974 Cost to Complete workload to the Special Workload.

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(4)

DIRECT LABOR WORKLOAD RECONCILIATION

2ND QUARTER REVIEW VERSUS SPECIAL REVIEW

(Excluding Site)
(000's)

	DIRECT LABOR HOURS				
	1974	1975	1976	1977	1978
2nd Quarter 1974 Cost to Complete	23,845	26,011	29,446	31,723	32,857
Additions	-	-	-	-	-
Deletions					
SSBN30C CY-76 Overhaul	(35)	(226)	(1,922)	(312)	-
SSBN30F CY-77 Overhaul	-	(40)	(201)	(1,867)	(392)
SSN 30H CY-77 R/Overhaul	-	(13)	(134)	(1,222)	(519)
SSN 30R CY-78 Overhaul	-	-	(48)	(134)	(433)
Changes					
SSN688's I (690's)	(231)	537	4,080	3,132	614
SSN688's II (700's)	(352)	(3,220)	(5,847)	(374)	3,096
SSN685	167	-	-	-	-
SSN571 Overhaul	826	110	-	-	-
SSBN616 Overhaul	91	2	-	-	-
SSN607 Overhaul	205	59	-	-	-
SSBN619 Overhaul	(382)	349	-	-	-
SSN667 Overhaul	281	96	-	-	-
SSN671 Overhaul	-	79	-	-	-
SSN585 Overhaul	(500)	500	413	22	-
SSBN626 Overhaul	-	-	567	-	-
SSN688's (Likely)	-	-	(44)	(82)	(318)
SSBN30I CY-77 Overhaul	-	-	2	23	168
Trident Const. Prog.	(9)	(30)	36	149	294
SSN30B CY-75 Overhaul	(13)	(430)	743	54	-
All Other Changes	(424)	(36)	(64)	3	8
Sub-Total	(341)	(1,984)	(114)	2,927	3,862
Total Additions/Deletions/Changes	(376)	(2,263)	(2,419)	(608)	2,518
2nd Quarter 1974 Special Review	23,469	23,748	27,027	31,115	35,375

DIRECT LABOR RATES

The labor rates utilized in the computation of costs for this Special Study are basically the same as those in the Second Quarter 1974 CTC. The revised workload was analyzed and it was felt that any mix change would be offset by additional Cost of Living adjustments, increases in wage differentials for skilled labor (as the apprentice program was upgraded), etc. The shift and overtime percentages were also the same as the Second Quarter 1974 Review.

OVERHEAD RATES

Overhead rates for this study were determined by adjusting the Second Quarter CTC rates for volume, additional indirect personnel, and a contingency factor. Workload changes had the most significant impact on overhead rates, particularly in 1975, 1976, and 1978. Additional indirect personnel were added to the overhead forecast each year in accordance with the rationale developed for the Trident lead ship proposal. However, the number of indirect personnel added for the special study (50-115) was only 40% of that added to the Trident proposal. A cumulative contingency factor increase from 1% per year to 2% was included starting in 1975. With more restrictive safety and environmental regulations, rising taxes and inflation, the original 1% cumulative factor appears inadequate. These adjustments resulted in ceiling overruns of $4.4 million to the 1974 ceiling and $7.4 million to the 1975 ceiling, which exceeded the Second Quarter Review position by $1.2 million and $3.2 million respectively.

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OVERHEAD RECONCILIATION

(Excluding Site)

(Rates/Dollars)

	1974		1975		1976		1977		1978	
	Rate	($000)	Rate	($000)	Rate	($000)	Rate	($000)	Rate	($000)
2nd Qtr. 1974 Review	73.4%	$92.7	83.3%	$121.7	81.0%	$142.7	78.6%	$160.4	75.7%	$171.7
Volume	.6	(.6)	4.4	(2.8)	3.8	(3.7)	.6	(.4)	(3.1)	5.3
Additional People	.9	1.1	.8	1.1	1.0	1.7	.4	.8	.4	.9
Additional Contingency	-	-	1.0	1.2	2.0	3.0	3.0	6.0	4.0	10.5
Special Study	74.9%	$93.2	89.5%	$121.2	87.8%	$143.7	82.6%	$166.8	77.0%	$188.4

OVERHEAD CEILING

($ Millions)

	1973	1974	1975	Total
2nd Qtr. 1974 Review	$3.4	$3.2	$4.2	$10.8
Volume	-	.1	.8	.9
Additional People	-	1.1	1.1	2.2
Additional Contingency	-	-	1.3	1.3
Special Study	$3.4	4.4	$7.4	$15.2

SPECIAL REVIEW

- 688 Forecast -

	Cost	Fee	Revenue
N00024-71-C-0268 690/692/694/696-699			
Basic Contract	369,029	43,914	412,943
Adjudicated Change Orders 3/30/74	243	90	333
Total Negotiated	369,272	44,004	413,276
Estimated Change Orders	1,890	192	2,082
Escalation	82,229	-	82,229
Total Authorized	453,391	44,196	497,587
Management Adjustment	-	-	-
Disallowances	9,289	(9,289)	-
Overrun or (Underrun) 70/30	135,017	(119,827)	15,190
Current Indicated Review at Ceiling	597,697	(84,920)	512,777
N00024-74-C-0206 SSN's 700-710			
Basic Contract	688,050	81,873	769,923
Adjudicated Change Orders 3/30/74	-	-	-
Total Negotiated	688,050	81,873	769,923
Estimated Change Orders	(133)	65	(68)
Escalation	239,310	-	239,310
Total Authorized	927,227	81,938	1,009,165
Disallowances	6,111	(6,111)	-
Overrun or (Underrun) 70/30 85/15	187,865	(111,169)	76,696
Current Indicated Review	1,121,203	(35,342)	1,085,861

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SSN688 I	Cumulative to Date Through June 1974	Total at Completion: Second Quarter 1974 Review	Total at Completion: Special Study	Variance
Hours	8,599	26,919	34,077	7,158
Direct Labor Rate	$4.6182	$5.0898	$5.2440	$.1542
Overhead Rate	109.69%	94.23%	96.02%	1.79 %
ODC Rate	12.00%	25.42%	26.93%	1.51 %
Direct Labor Dollars	$ 39,712	$137,012	$ 178,699	$ 41,687
ODC Dollars	4,766	34,826	48,117	13,291
Overhead Dollars	43,560	129,109	171,588	42,479
Overtime/Shift	2,220	6,922	8,980	2,058
Material Dollars	100,926	172,339	190,313	17,974
Total	$191,184	$480,208	$ 597,697	$ 117,489
Profit	$ 3,856 (2)	$ 26,028	$ (84,920)	$(110,948)
Revenue	-	$506,236 (1)	$ 512,777 (1)	$ 6,541
Escalation				
Labor	$ 5,368	$ 59,106	$ 65,433	$ 6,328
Material	14,347	16,582	16,796	214
Total	$ 19,715	$ 75,688	$ 82,229	$ 6,542

SSN688 II	Cumulative to Date Through June 1974	Total at Completion: Second Quarter 1974 Review	Total at Completion: Special Study	Variance
Hours	51	40,526	47,420	6,894
Direct Labor Rate	$6.2352	$6.2341	$6.9494	$.7153
Overhead Rate	81.76%	84.38%	83.41%	(.97)%
ODC Rate	29.29%	31.20%	31.30%	.10 %
Direct Labor Dollars	$ 318	$252,643	$ 329,539	$ 76,894
ODC Dollars	93	78,825	103,135	24,310
Overhead Dollars	260	213,189	274,856	61,667
Overtime/Shift	5	11,887	15,354	3,467
Material Dollars	4,508	338,000	398,319	60,319
Total	$ 5,184	$894,544	$1,121,203	$ 226,659
Profit	$ 256 (2)	$ 76,031	$ (35,342)	$(111,373)
Revenue	-	$970,575	$1,085,861 (1)	$ 115,286
Escalation				
Labor	$ 86	$147,256	$ 168,391	$ 21,135
Material	3,114	49,881	70,919	21,038
Total	$ 3,200	$197,137	$ 239,310	$ 42,173

(1) At Ceiling
(2) booked through June 1974

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DIRECT LABOR ESTIMATING TECHNIQUE-- 688 I and 688 II

I. SY/MS MANHOURS

The estimate for cost at completion was arrived at as follows:

A. Actual returns and progress on substantially completed work (35%) (principally 300's, 400's and 800's).

B. Past performance and weight report, adjusted for current productivity (35%) (principally 600's & 700's, some 500's).

C. Account Review using actuals, progress, past projections and judgement (30%) (principally 100's & 200's).

II. All Other Manhours for Support Departments

A. Manhours that were requested but not included in the Second Quarter Cost to Complete were used.

III. Improvement Curve

A. Closed group and BM work on the 690 and 692 were compared (about 50,000 hours).

B. Projections for the steel work for the 690, 692, and 694 were compared.

C. Projections for the Class identifying areas for improvement and estimates of the improvement.

D. The above techniques indicated a 90% curve was possible on the first seven boats. A judgement that this rate of improvement would not continue on the next eleven but return to the past level of 94% was made.

IV. Subcontract

A. 688 I was adjusted for subcontract of 1,983,000 manhours

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DIRECT LABOR ESTIMATING TECHNIQUE --688 I AND 688 II
Page Two

V. Schedule

A. The delivery of the 690 was projected (3 months slip from the Second Quarter Cost to Complete).

B. The people necessary to deliver three ships per year will not be available until the 696 boat and thus the interval for the 692 and 694 was projected at six months.

C. After the 694 delivery, delivery for the remaining boats was projected at four-month intervals.

VI. Construction on Land-Level Facility

A. To maintain four-month interval, construction of two boats is necessary on the slab. These were assumed to be the SSN698 and 699.

B. 454,000 manhours were added to the 698 and 699 boats for facility start-up costs. This is consistent with the Trident bid.

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688 PROGRAM SUMMARY

	Direct Labor (Manhours X 1000)							Material			Delivery		
	2nd Qtr. CTC*			Special Study			Variance	2nd Qtr. CTC	Special Study	Variance	2nd Qtr CTC	Special Study	Variance Months
Ship	E01/E02	Other	Total	E01/E02	Other	Total	(Hours)	($000)	($000)	Dollars			
690	4,482.5	1,914.9	6,397.4	5,109.0	1,957.8	7,066.8	669.4	24,834	27,801	2,967	12/75	3/76	3
692	3,659.1	755.6	4,414.7	4,278.0	808.0	5,086.0	671.3	23,077	24,954	1,877	5/76	9/76	4
694	2,966.6	678.4	3,645.0	3,997.0	738.8	4,735.8	1,090.8	23,466	25,353	1,887	9/76	3/77	6
696	2,685.5	653.5	3,339.0	3,591.0	723.9	4,314.9	975.9	26,361	29,206	2,845	12/76	7/77	8
697	2,540.3	587.5	3,127.8	3,513.0	661.9	4,174.9	1,047.1	26,561	29,414	2,853	3/77	11/77	8
698	2,466.0	549.8	3,015.8	3,817.6	624.8	4,442.4	1,426.6	24,355	27,156	2,801	6/77	3/78	9
699	2,440.8	538.8	2,979.6	3,640.0	616.2	4,256.2	1,276.6	23,646	26,429	2,783	9/77	7/78	10
Sub Total	21,240.8	5,678.5	26,919.3	27,945.6	6,131.4	34,077.0	7,157.7	172,339	190,313	17,974			
700	3,186.0	1,034.3	4,220.3	3,676.0	1,034.3	4,710.3	490.0	29,447	33,917	4,470	10/77	11/78	13
701	2,998.0	775.9	3,773.9	3,638.0	775.9	4,413.9	640.0	28,985	33,487	4,502	2/78	3/79	13
702	2,957.7	764.4	3,732.1	3,603.0	764.4	4,367.4	635.3	29,270	33,826	4,556	7/78	7/79	12
703	2,939.7	760.4	3,700.1	3,573.0	760.4	4,333.4	633.3	29,722	34,338	4,616	11/78	11/79	12
704	2,913.3	755.4	3,668.7	3,545.0	755.4	4,300.4	631.7	30,017	34,689	4,672	1/79	3/80	14
705	2,890.7	750.9	3,641.6	3,520.0	750.9	4,270.9	629.3	30,320	36,207	5,887	5/79	7/80	14
706	2,869.2	757.1	3,626.3	3,496.0	757.1	4,253.1	626.8	30,885	36,867	5,982	9/79	11/80	14
707	2,865.2	748.4	3,614.6	3,476.0	748.4	4,224.4	609.8	31,545	37,372	5,827	1/80	3/81	14
708	2,799.8	768.3	3,568.1	3,456.0	768.3	4,224.3	656.2	32,005	38,630	6,625	5/80	7/81	14
709	2,813.8	734.4	3,548.2	3,437.0	734.4	4,171.4	623.2	32,662	39,264	6,602	9/80	11/81	14
710	2,798.2	731.1	3,529.3	3,419.0	731.1	4,150.1	620.8	33,142	39,722	6,580	1/81	3/82	14
Sub Total	32,042.6	8,580.6	40,623.2	38,839.0	8,580.6	47,419.6	6,796.4	338,000	398,319	60,319			
Total	53,283.4	14,259.1	67,542.5	66,784.6	14,712.0	81,496.6	13,954.1	510,339	588,632	78,293			

*688-II E01/E02 is Basic Budget Hours plus Management Reserve

E01/E02 is Machine Shop/Shipyard

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August 8, 1974

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SSN688 CLASS

Cost Analysis

(000)

	Variance	688 I	Variance	688 II
Second Quarter Review		$480,208		$ 894,544
Manhours	$80,024*		$92,651*	
Direct Labor Rates	11,541*		73,118*	
Overhead Rates	3,194		(3,224)	
ODC Rate	2,698		330	
Shift/Overtime	2,058		3,467	
Material	17,974	117,489	60,319	226,661
Special Study		$597,697		$1,121,205
Escalation Recovery				
Second Quarter		$ 75,688		$ 197,137
Increase		6,541		42,173
Special Study		$ 82,229		$ 239,310

Includes Applied OH/ODC

MANHOUR PHASING

	1974	1975	1976	1977	1978	Balance Over
688 I						
2nd Qtr CTC	5,772.0	8,462.5	4,920.2	967.7	86.1	-
Adjustment	1,171.9	200.9	3,743.2	2,989.4	711.3	-
Special Study	6,943.9	8,663.4	8,663.4	3,957.1	797.4	-
688 II						
2nd Qtr CTC	364.2	4,660.2	8,643.0	9,711.2	9,241.0	7,892.4
Adjustment	13.6	(3,681.6)	(5,578.5)	(682.0)	2,977.5	13,858.6
Special Study	377.8	978.6	3,064.5	9,029.2	12,218.5	21,751.0

The adjustment includes the additional hours required to complete the ship plus the rephasing to the anticipated delivery schedule.

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(14)

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688 I Material Reconciliation

($ Million)

2nd Quarter CTC. 172.3

Improvement: This is the amount of overrun excluded from the 2nd Quarter CTC in anticipation of possible improvements in material cost performance, now judged improbable 3.0

Sub Total (2nd Quarter Total Estimated Cost) 175.3

Changes:

1. Farmout: It is estimated that an additional growth in farmout premium can be expected over the 2nd Quarter 5

2. Purchase Orders not Received from Newport News: Our latest discussions with the Lead Yard indicate a probable additional $600,000 worth of purchase orders per boat has yet to be received. 4.2

3. Coded Stock: A recent purification of the Ship's Bill of Material has facilitated a more accurate assessment of the cost at completion for coded stock. To the extent that the Ship's Bill is stated in 1972 type prices, escalation was applied to correspond to material deliveries for the first three and last four boats respectively to arrive at the total cost at completion

Revised	CAC	$36.5 Million	(5.2 avg. per boat)
2nd Qtr	CAC	29.6 Million	(4.2 avg. per boat)

Net Change. 6.9

4. Construction Services: Latest returned costs indicate additional increases in construction services in such items as preheat and other fuel related items 1.1

5. Schedule Slip: On the later boats it is estimated that for some coded stock not yet purchased and most of the construction services not yet expended there will be an additional growth due to the resultant escalation from an average delay in ship construction schedules of 8 months. 2.3

Total Increase over 2nd Quarter Estimate 15.0

Revised Cost at Completion 190.3

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688 II Material Reconciliation

		($ Million)
2nd Quarter CTC		338.0
Improvement: This represents the amount of overrun which was excluded from the 2nd Quarter CTC in anticipation of possible improvements in material cost performance, now judged improbable.		4.7
Sub Total (2nd Quarter Total Estimated Cost)		342.7
Changes:		
1. Farmout: It is estimated that 420,000 hours of shipyard farmout will be required. The estimated premium is 30%. Total cost of premium = 420,000 hours x $13.60/hour x .30	1.7	
2. Coded Stock: (See Page 2 for Details)	10.1	
3. Escalation: (See Page 2 for Details)	32.7	
4. Schedule Slip: (See Page 3 for Details)	11.1	
Total Increase over 2nd Quarter Estimate		55.6
Revised Cost at Completion		398.3

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688 . Material Reconciliation Details

Change:

Page 2 of 3

1. Farmout: Detail is on Page 1

2. Coded Stock: A Ship's Bill of Material for the 2nd Flight has been developed since the 2nd Quarter CTC. Because this bill of material is expressed in January '74 dollars, escalation as it is now projected below at 12%/year (consistent with the Trident bid) must be added for future deliveries. The 2nd Quarter Estimate for coded stock was built off the first flight estimated CAC

Revised estimated cost including revised escalation		69.9 (6.4 avg. per boat)
2nd Quarter Estimate:		
Basic Contract	45.5	
Overrun based on 1st flight performance now judged to be included in revised escalation adjustment	9.5	
2nd Quarter escalation adjustment for stock	4.8	
Total 2nd Quarter Estimate		59.8 (5.4 avg. per boat)
Net Change from 2nd Quarter		10.1

3. Escalation: It is estimated that from now to the mid point of the second flight (10/76), escalation will average 12% per year, which is consistent with that used in the Trident bid. Actual escalation to May '74 from the mid point of the first flight (10/73) has been 20% using the cost index developed for Trident. Combining these factors results in a total escalation from first to second flights of 57.88%.

The escalation in the bid estimate was 26.04% and thus the net increase over the bid = 1.5788 ÷ 1.2604 = 25.26%

Basic Contract Estimate	297.4	
Less Coded Stock which includes revised escalation above	(45.5)	
Sub Total	251.9	
Escalation Increase %	x .2526	
Escalation Increase over Basic Bid		63.6

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The 2nd Quarter CTC assumed an average 11.3%/year escalation from first to second flights. Because no cost index was available for the 2nd Quarter, the magnitude of extraordinary escalation from the midpoint of the first flight to the time of the 2nd Quarter estimate was not known.

Basic Contract Estimate	297.4
Less Coded Stock which has escalation included in 2. above	(45.5)
First Flight Overrun carried over to 2nd Flight and now judged as part of the 20% cost index escalation mentioned above	6.9
Total Escalatable Material	258.8
2nd Quarter Escalation Increase ($1.113^3 \div 1.2604$)	x .093
2nd Quarter Escalation Increase	24.0

In addition, the 2nd Quarter CTC included 6.9 million of Components, Specialties, and Purchased Services overrun based on 1st Flight overrun. This overrun is now considered to be escalation related and included in the 20% cost index escalation mentioned above.

Total Change in escalation from 2nd quarter:

Revised escalation adder	=	63.6
Less: 2nd Quarter adders	=	(24.0)
		(6.9)
Total Escalation Increase		32.7

4. Schedule Slip: It appears that material deliveries and expenditures will slip about 3 months from the original schedule, resulting in further additional escalation on all material, including the above changes, of 2.87% (12%/year)

2nd Quarter Estimated Cost	342.7
Farmout	1.7
Coded Stock	10.1
Escalation	32.7
Sub Total	387.2
	x .0287
Cost of Schedule Slip	11.1

688 I MATERIAL RECONCILIATION

Special Review vs Bid Estimate		$ (000)	
Bid Estimate.		139.5	
Changes to Original as of 2nd Quarter 1974			
1. Farmout	20.9		
2. Bad Estimate (Steel, Heat Exchangers, Coded Stock)	7.5		
3. Escalation	5.6		
4. Other (Construction services not in original scope)	1.8		
Sub Total		35.8	
2nd Quarter Estimate.		175.3	175.3
Improvement		(3.0)	
2nd Quarter CTC		172.3	
Changes Subsequent to 2nd Quarter 1974			
1. Farmout Premium	.5		
2. Bad Estimate (Coded Stock and other scope)	5.9		
3. Escalation (primarily on Coded Stock)	6.3		
4. Schedule Slip	2.3		
Sub Total			15.0
TOTAL COST AT COMPLETION ESTIMATE			190.3

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688 II MATERIAL RECONCILIATION

Special Review vs Bid Estimate

		$ (000)	
Bid Estimate.		297.4	
Changes to Original as of 2nd Quarter 1974			
1. Bad Estimate (by virtue of using the First Flight Estimate as a basis for most accounts)	16.4		
2. Escalation (increased from 8% to 11% for 3 yrs)	28.9		
Sub Total		45.3	
2nd Quarter Estimate.		342.7	342.7
Improvement		(4.7)	
2nd Quarter CTC		338.0	
Changes Subsequent to 2nd Quarter 1974			
1. Farmout Premium (420,000 hrs @ 30% premium)	1.7		
2. Bad Estimate (by virtue of having used the First Flight budget as a base ship)	.6		
3. Escalation (increased from 11% to 12% for 3 yrs plus 20% of actuals from 10/73 - 5/74 using TRIDENT cost index)	42.2		
4. Schedule Slip (3 months at 12% escalation)	11.1		
Sub Total			55.6
TOTAL COST AT COMPLETION ESTIMATE			398.3

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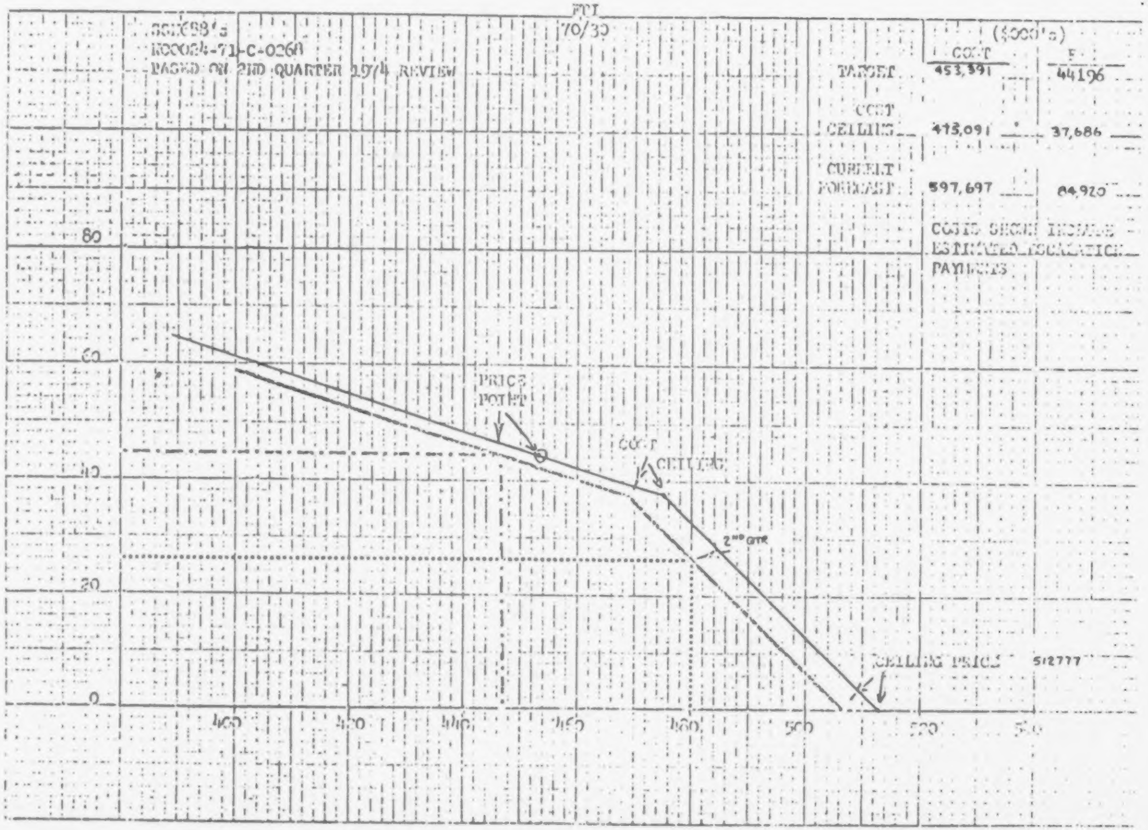

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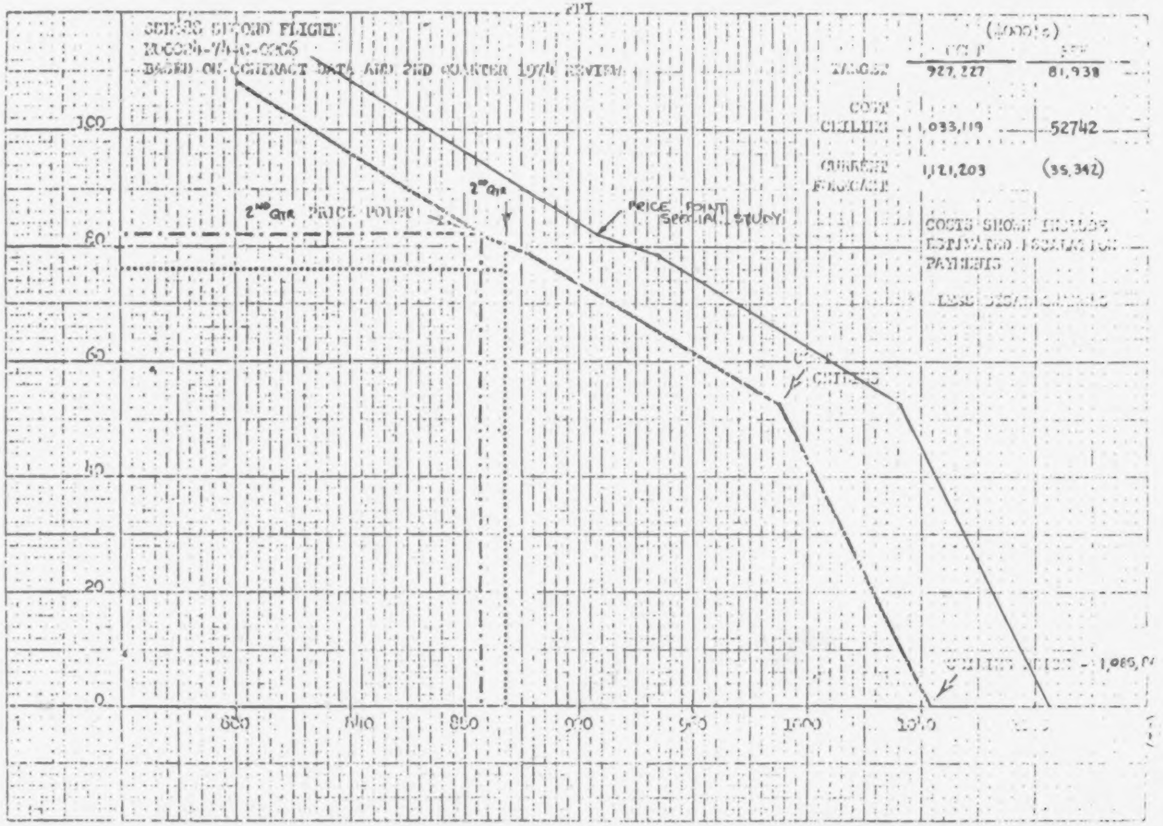

688 RISK ANALYSIS

The possible range of the manhour estimate and material estimate is shown below.

688 I

	Potential Increase Cost X1000	Potential Decrease Cost X1000
MANHOURS		
SY/MS Manhour Estimate	4,100	600
Improvement Curve	1,500	1,000
Support Area Manhours	1,500	0
Delivery Schedule	500	500
Total Manhours	7,600	2,100
DOLLARS		
Manhour Dollars	$ 91,200	$ 25,200
Delivery Schedule Rate Variance	6,000	6,000
Material Dollars	7,600	3,500
Delay Claim	0	19,300
Potential Cost Increase/Decrease	$ 104,800	$ 54,000
Profit Impact @ Completion	$(104,800)	$ 54,000
Special Study Profit Position	$ (85,800)	$(85,800)
Potential Outcome	$(190,600)	$(31,800)

688-II

	Potential Increase Cost X1000	Potential Decrease Cost X1000
MANHOURS		
SY/MS Manhour Estimate	6,500	900
Improvement Curve	3,500	1,500
Support Area Manhours	3,000	1,000
Delivery Schedule	1,500	1,000
Total Manhours	14,500	4,400
DOLLARS		
Manhour Dollars	$ 204,000	$ 66,000
Delivery Schedule Rate Variance	22,000	15,000
Material Dollars	40,200	18,400
Delay Claim	0	38,500
Potential Cost Increase/Decrease	$ 266,200	$137,900
Profit Impact @ Completion	$(266,200)	$104,900
Special Study Profit Position	$ 35,300	$ 35,300
Potential Outcome	$ (301,500)	$ 69,600

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DETAIL OF 688 I AND II RISK - MATERIAL

MATERIAL COST:	688 I		688 II	
	Potential Cost Decrease $ (Million)	Potential Cost Increase $ (Million)	Potential Cost Decrease $ (Million)	Potential Cost Increase $ (Million)
1. Farmout Premium	(0)	0.5	(0)	13.7
2. Coded Stock Estimate	(0.5)	1.3	(1.5)	2.8
3. Escalation in Other Material	(included in 2. and 6.)		(12.3)	20.4
4. P.O.'s from NPN	(1.4)	3.7	(included in 3. above)	
5. Schedule Slip	(1.1)	1.1	(1.2)	41.1
6. Construction Services	(0.5)	2.0	(1.0)	4.0
	(3.5)	8.6	(16.0)	82.0
ESCALATION RECOVERY:				
Estimated Range of BLS Escalation Recovery	16.8	17.80	68.4	112.6
Current Estimated Recovery	16.8		70.8	
Risk over Current Estimate	(0)	(1.0)	(2.4)	(41.8)
NET RISK (Cost less Escalation Recovery)	(3.5)	7.6	(18.4)	40.2

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COST IMPROVEMENTS

- SSN688 I and SSN688 II -

SSN688 I

Potential Manhour Reductions	Manhours (000's)
Assignment of Better Trades Personnel & Supervision	1,000
Trade Rollover, Multiple Manufacture	400
Methods Improvement	400
Design Improvement	100
	1,900

Potential Cost Savings	($000's)
Value of Above Manhour Reductions	$ 22,800
Additional Backshift During 1975 (Rate Savings)	2,000
Other Changes (Farmout of Site work, slip Trident, emphasize budgets, etc.)	2,000
	$ 26,800

SSN688 II

Potential Manhour Reductions	Manhours (000's)
Assignment of Better Trades Personnel & Supervision	2,000
Trade Rollover, Multiple Manufacture	1,500
Methods Improvement	1,500
Design Improvement	300
	5,300

Potential Cost Savings	($000's)
Value of Above Manhour Reductions	$ 79,500
Early Fabrication (Rate Savings)	2,000
Construction of One Additional Boat on Slab (Rate Savings)	10,000
Accelerate Material Procurement	23,000
	$114,500

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SUBCONTRACT POLICY

It is evident that we should perform 688-I work in the most cost effective physical location. This is frequently not being done. We are continuing to subcontract 688-I work at a premium while doing other work in house.

A specific example of this is the Torpedo Handling Stowage System Structure make or buy package, where, due to S8G work being done at Quonset, 688-I work is being subcontracted at a premium (Make or Buy Directive 85-1, dated August 2, 1974).

In this instance:

The cost of doing the structure at EB is	$761,700
Cost for farmout	$910,000
Premium over EB	$148,300

Note: The premium may, in fact, be larger than this because presently cost levels at Quonset are below Groton cost levels.

In this case had S8G work been assigned a lower priority than 688-I work, the S8G work could have been subcontracted instead of the 688-I work. Capacity/workforce limitations will cause us to subcontract significant additional 688-I work, at a premium, unless priorities are reordered.

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DIRECT LABOR RATES FOR JUNE, 1974

	571	607	616	619	667	671	690	692
Shipfitters	5.15	4.91	4.66	4.80	4.92	4.99	4.62	4.47
Welders	5.48	5.36	5.28	5.01	5.01	5.23	5.02	4.58
Outside Electricians	5.29	4.71	5.06	4.65	4.77	4.63	4.45	4.22
Outside Machinists	5.34	5.03	5.06	4.69	5.01	4.96	4.90	4.59
Pipefitters	4.86	4.81	5.03	4.67	4.68	4.81	4.38	4.35
Straight Average	5.22	4.96	5.02	4.76	4.88	4.92	4.67	4.44

The direct labor rates for the month of June for selected trades for specific boats are shown above. The straight average rate is the arithmetic average of the other five rates.

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ESCALATION STUDY

Special Review vs Claim Delay

	Escalation Recovery Forecast Rate	SSN688 I ($000) Amount	SSN688 II ($000) Amount
Special Review			
Labor	6.0%	65,433	168,391
Material	10% 1974/8% year	16,796	70,919
TOTAL	-	82,229	239,310
Claim Delay			
Labor (1-year slip)	6.0%	79,861	200,155
Material (688 I 6 mos/ 688 II 3 mos)	10% 1974/8% year	21,582	77,631
TOTAL	-	101,443	277,786
ADDITIONAL RECOVERY POSSIBLE *		19,214	38,476

* These amounts are those that could be obtained if it were possible to claim that there was a delay to the Division's program caused by the Newport News performance.

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ESCALATION CLAIM

Table opposite indicates additional escalation recovery that could be obtained from a claim based solely on a change in the escalation clause of the SSN688 contracts. In the case of material escalation, the claim could be based on the allegation that deliquent Newport News plans and design information precluded our placement of purchase orders to our contract schedule and consequently caused us to incur increased material costs. In the case of labor escalation, the claim would be based on the allegation that the late plans and design information combined with the late receipt of material to cause delays in our start of work on this contract.

Any claim for added labor escalation recovery on the SSN690 contract and any claim for added escalation recovery of labor or material on the SSN700 contract appears to be very speculative at this time based upon statements made by the Division to the Government in critical items letters.

The basis for the calculation of added escalation recovery was the application of the anticipated BLS index growth to the labor and material expenditure phasings contained in each of the contracts. The base months were slipped six months in the case of labor and material on the SSN690 contract, and three months for material on theSSSN700 contract to reflect the schedule impact of the late design information discussed above.

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Comments to Cash Flow Chart

The Cash Flow Chart reflects the increase/decrease on the 2nd Quarter Profit Review total Division forecast (left column) as developed by the Special Study utilizing revised cost to complete data for the three major construction contracts.

Progress payments were developed using the progress payment clause of each contract. Physical progress percentages were developed by dividing the forecasted cost incurred by the estimated cost at completion. This assumes physical progress and cost incurred are directly related.

An analysis of the chart indicates that both the SSN 688 I and II Construction contracts reflect an impact on cash flow. This is primarily due to the fact that the 2nd Quarter Profit Review reflected a profit while the Special Study indicates a loss.

The TRIDENT Construction contract reflects an increase in cash flow primarily due to an increase in forecasted escalation recovery on the contract.

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CASH FLOW EFFECT BETWEEN SECOND QUARTER PROFIT REVIEW AND SPECIAL STUDY

- Major Construction Contracts Only -

(Millions - Cumulative)

Total Division		Net Cash Flow Increase (Decrease) to Second Quarter				
		Special Study				
Year	Second Quarter 1974	Year	Trident	SSN688 I	SSN688 II	Total
1974	$(41.0)	1974	$ (.2)	$ (23.0)	$ .2	$ (23.0)
1975	$(37.5)	1975	(.3)	(91.1)	3.8	(87.6)
1976	$(46.0)	1976	14.6	(102.5)	18.5	(69.4)
		1977	45.5	(114.8)	(34.5)	(103.8)
		1978	99.2	(110.9)	(77.4)	(88.7)

Table at right shows cumulative net cash flow reduction to Second Quarter forecast resulting from changes in profit position on major construction contracts.

TRIDENT

The cumulative cash outflow on TRIDENT construction per the Second Quarter Review was $99.2 million by 1978. In the Special Study, increase profit rate, higher escalation payments, and revised withholding clauses result in Division being limited to receiving 100% of cost incurred and thus there is a cumulative net improvement of $99.2 million by the end of 1978.

688-I

The cumulative cash flow reduction of $110.9 million below the second quarter position reflects reduction in profit on this contract from $26.0 million in the Second Quarter Review to the current Special Study position of an $84.9 million loss.

[illegible]

[illegible] was $99.2 million by 1972. In Spec[illegible]

[illegible] closures result in Dyn[illegible]

[illegible] net improvement of $99.2 million.

[illegible]

THE CUMULATIVE [illegible] FROM REDUCTIONS [illegible] 110.5 MILLION BELOW THE 2ND QTR. POSITION REFLECTS [illegible] REDUCTION [illegible] ON THIS CONTRACT FROM 26.0 MILLION IN THE 2ND QTR. REVIEW TO THE CURRENT SPECI[illegible] STUDY POSITION OF (84.9) MILLION.

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SPECIAL STUDY PROFIT ASSUMPTIONS

The Profit Assumptions used for the Second Quarter Review were also employed for the Special Study with the following exceptions:

1. All major new construction and overhaul contracts were revised to reflect current Cost Engineering estimates of cost at completion.

2. Labor Escalation Recovery was projected at an index growth of 6% per year (vs. 5.5% in Second Quarter) from the most current base of February 1974. Material recovery was projected at an index growth of 10% for the year 1974 and at 8% for every year thereafter (vs. about 6.5% in Second Quarter plus $5 million adjustment on 688 II). The base for Trident material recovery was February 1974 while the latest actual of April 1974 was utilized for all other contracts due to need for additional information required to compute a composite weighted base rate for the Trident contracts.

3. 688 I and II. In the Second Quarter Review, profit rates of 6%, 7%, and 8% were used for the years 1974, 1975, and 1976 respectively, per Corporate direction. However, in the Special Study, booking rates reflect the projected loss based on the new cost at completion.

4. Trident Construction. Negotiated prices for lead and three follow Tridents were used with no estimated change order revenue.

5. Revenue forecasts for all other contracts remained as per the Second Quarter Review except for the 667/671 Overhaul and the 585 Overhaul contracts. Change order activity totaling $2.5 million in cost was

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SPECIAL STUDY PROFIT ASSUMPTIONS
Page Two

5. (Cont'd)

used on the 667/671 Overhaul and $5.0 million in cost was used on the 585 Overhaul at the basic contract profit rates.

6. Miscellaneous Firm and Likely Overhaul Business profit rates were reduced by 1.5% to reflect recent performance and ceiling overruns. (Firm now 6.5%, Likely now 6%).

7. Total Engineering Second Quarter profit rate was reduced by 1/2% to account for increased ceiling overruns since individual profit reviews were not revised on these contracts. This reduction results in a 10% decrease in 1974 Engineering profit.

8. On the MARF Engine Room Construction Contract, a profit rate at completion of 5% was used in the Second Quarter Review with a Management Reserve of $1,347,000. However, in the Special Study, the Management Reserve was eliminated and profit at completion was increased accordingly.

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OPERATING PROFIT SUMMARY

	1974	1975	1976
Approved Budget	23.0	29.9	45.7
First Quarter Report	22.3	32.9	46.3
Second Quarter Report	17.6	35.2	46.7
Special Study	(34.7)	(2.3)	9.5
SSN688 Class Profit Improvement			
SSN688 I ($5.1M Loss)	36.5	18.5	15.6
SSN688 II ($69.[illegible] Profit)	1.1	6.6	12.9
Elimination of Overhead Ceiling	4.9	1.6	0.9
Potential Outcome	7.8	24.4	38.9

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688 I AND 688 II [illegible]IMATE SUMMARY

	2nd Qtr. Position	Manhours	Schedule	Inflation	Estimated Cost per Special Study	Best Possible Position	Break Even Position
688 I							
Manhours SY/MS	21,240.8	6,704.8			27,954.6	23,945.6	21,842.8
Other	5,678.5	452.9			6,131.4	6,131.4	5,800.0
Direct Labor Dollars	137,011.8	36,432.7	4,430.0	824.7	178,699.2	148,523.8	144,958.8
ODC	34,826.7	9,253.9	1,355.6	2,681.0	48,117.2	42,427.7	38,993.9
Overhead	129,108.8	34,319.6	3,827.5	4,332.1	171,588.0	151,414.8	139,160.4
Overtime	4,519.0	1,030.7	146.2	24.7	5,720.6	5,047.2	4,638.7
Shift	2,403.0	655.8	79.7	120.6	3,259.1	2,839.0	2,718.2
Material	172,338.5	0	2,300.0	15,674.5	190,313.0	186,813.0	182,300.0
Total Cost	480,207.8	81,692.7	12,139.0	23,657.6	597,697.1	537,065.5	512,770.0
Escalation Recovery							
Labor	59,106.0	0	0	6,327.0	65,433.0	65,433.0	65,433.0
Material	16,582.0	0	0	214.0	16,796.0	16,796.0	16,796.0
Escalation Claim	0	0	0	0	0	19,200.0	0
Total	75,688.0	0	0	6,541.0	82,229.0	101,429.0	82,229.0
Contract Ceiling	506,236.0				512,777.0	531,977.0	512,770.0
Profit Position	26,028.2				(84,920.1)	(5,088.5)	0
688 II							
Manhours SY/MS	32,042.6	6,796.4			38,839.0	29,139.0	
Other	8,580.6	0			8,580.6	7,580.6	
Direct Labor Dollars	252,642.9	42,266.8	25,132.4	9,497.2	329,539.3	245,964.5	
ODC	78,824.8	13,187.2	7,866.4	3,256.5	103,134.9	79,866.5	
Overhead	213,190.1	35,673.2	20,633.7	5,359.1	274,856.1	212,807.2	
Overtime	7,529.6	1,268.0	728.8	194.1	9,720.5	7,399.8	
Shift	4,356.9	718.5	427.3	132.0	5,634.7	4,337.8	
Material	337,999.9	0	11,100.0	49,219.1	398,319.0	356,919.0	
Total Cost	894,544.2	93,113.7	65,888.6	67,658.0	1,121,204.5	907,294.8	
Escalation Recovery							
Labor	147,256.0	0	0	21,135.0	168,391.0	168,391.0	
Material	49,881.0	0	0	21,038.0	70,919.0	70,919.0	
Escalation Claim	0	0	0	0	0	38,500.0	
Total	197,137.0			42,173.0	239,310.0	277,810.0	
Contract Ceiling	1,043,917.0				1,085,861.0	1,124,361.0	
Profit Position	76,031.0				(35,343.5)	69,600.0	

BEST POSSIBLE POSITION IS POTENTIAL DECREASE COST PLUS COST IMPROVEMENTS.

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IMPACT OF CEILING ELIMINATION

- Special Study -

($000's)

	Total at Completion		
	Ceiling Disallowances	Share Ratio	Profit Impact
NEW CONSTRUCTION			
SSN688 I - 0268	5,767	0/100	-
SSN688 II - 0206	458	0/100	-
SSN685 Construction - 0307	382	85/ 15	325
Trident Lead	501	95/ 5	476
Trident Follows	71	70/ 30	50
Other Firm and Likely	99	70/ 30	69
Total New Construction	7,278	13/ 87	920
REFUEL, OVERHAUL, CONVERSION			
571/597 Overhaul - 0264	799	100/ 0	799
616 Overhaul - 0277	707	100/ 0	707
607 Second Overhaul - 0255	565	100/ 0	565
619 Overhaul - 0245	883	100/ 0	883
667/671 Overhaul - 0205	799	80/ 20	639
585 Overhaul - 0272	745	100/ 0	745
626 Overhaul - 0261	404	100/ 0	404
Miscellaneous Firm Business	337 }	80/ 20	527
Likely Business	322		
Total Refuel, Overhaul, Conversion	5,561	95/ 5	5,269
ENGINEERING	2,194	100/ 0	2,194
LAND BASED PROTOTYPES	167	100/ 0	167
TOTAL DIVISION	15,200 -	56/ 44	8,550

Ceiling disallowances total disallowances applied to each contract as a result of overruns to the 1973-1975 overhead ceilings.

Profit impact is increase in profit at completion resulting from elimination of overhead ceiling. The share ratio varies according to the cost sharing provisions of our contracts.

/7/74

23

2

GENERAL DYNAMICS
St. Louis Corporate Office

Date: 14 October 1974

To: David S. Lewis

From: M. Golden

Subject: Third Quarter 1974 Program Review - Electric Boat

Here are Homer Boyd's views

on the current trend at Electric Boat.

MG.

RECEIVED
OCT 11 1974
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GENERAL DYNAMICS

INTER-OFFICE MEMO

Memo No. HEB-74-140
9 October 1974

To: Mr. Max Golden

From: H.E. Boyd

Subject: THIRD QUARTER 1974 PROGRAM REVIEW - ELECTRIC BOAT

Attachments: (A) Shipyard Performance Trends
(B) Overhaul Status Summary

A review of programs at Electric Boat in early September 1974 reveals many areas of concern.

OVERHEAD

Interpretations of the 1972 overhead ceiling agreement by government auditors is resulting in sizable differences. Efforts to delete the existing agreement met with no success in Washington. Current Navy direction is for E-B to propose specific modifications to the agreement and submit at the local level (supships-Groton). In my opinion this is of major importance.

688 CONSTRUCTION PROGRAM

LABOR

Efforts to improve performance are showing signs of working in some task areas; but, overall the trend is worsening. Copies of elemental tasks areas trend charts from Electric Boat are attached.

MATERIAL

Coded stock usage has increased to an unusually high level and will increase material costs significantly unless this trend is turned around.

Subcontract (farm-out) in all probability will result in numerous claims along the same lines as the claims submitted by Ft. Worth. Late material, faulty material (wrong spec. material, material cut too small, unacceptable castings, etc.) and drawings different from those furnished for bidding purposes, etc.

I have seen two claims from outside vendors and it appears many more can be expected.

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Page 2
Memo No. HEB-74-140
9 October 1974

OVERHAULS

The overhaul programs continue to increase in cost and slip in schedule. All ships currently in work indicate overruns at delivery (even the 585 which has only been in the yard approximately 2 months).

Attached is a summary of cost and schedule data on ships currently in work.

H. E. Boyd

H.E. Boyd

/cmm

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H. E. Boyd
9 October 1974

688 CONSTRUCTION (1st FLIGHT)
(In Millions)

Shown below is a comparison of the "most likely"* Corporate team position (February 1974 Review) and my current feelings:

Element	February 1974	September 1974
Manhours	32.2	33.3
Dollars		
Labor	168.8	175.1
Overhead	134.3	139.2
Other Direct Charges	53.4	55.1
Material	171.4	180.7
Total Cost	527.9	550.1
Revenue	504.3	505.3
Loss	(23.6)	(44.8)

The change activity seems excessively low in identifying and proposing changes that impact cost. I have data through December 1973 on the paper received from the design agent which totaled some 6,600 drawing revisions; and, 7,500 design notices, drawing revision notices and liaison problem and solution reports. If this trend is continuing it appears we should have a large volume of changes being processed—this I don't see. Data from change control is shown below:

All data is as of 24 August 1974

Adjudicated	$747,286 (Includes 11.9% fee)
Unilateral Chgs.	
Submitted (8)	277,365 (Includes 11.9% fee)
Unsubmitted (9)	97,381 (Includes 11.9% fee)

*As you recall, in February the team had 3 positions:
Optimistic, most likely and pessimistic. Corporate Financial Management chose to use only the optimistic position (in the formal review), which was based on E-B achieving a major portion of their cost reduction items; most likely assumed achievement of slightly over 50% while pessimistic assumed most would result in no cost reduction.

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Attachment (A)
H. E. Boyd
9 October 1974

SHIPYARD PERFORMANCE TRENDS

688 Construction Program (Flight I)

An analysis of 688 construction (first 7 ships) indicates the following:

Chart No.

1. Overall shipyard performance is continuing to erode although at a very slow rate.

   138 pts. on 31 December 1973 vs. 148 pts. on 28 September 1974.

2. New construction (work on building ways basically) has shown a steady degrading performance trend.

   131 pts. on 31 December 1973 vs. 150.5 pts. on 28 September 1974.

4. Manufacturing (work off hull) is following a downward trend although it has experienced many ups and downs.

   133 pts. on 31 December 1973 vs. 125 pts. on 28 September 1974.

5. Nuclear experienced a solid downtrend but during September 1974 surged upward but is still overall in a downward trend.

   174 pts. on 31 December 1973 vs. 160 pts. on 28 September 1974.

5A. Nuclear installations are following a steady trend of degraded performance.

   145 pts. on 31 December 1973 vs. 166 pts. on 28 September 1974.

6. Testing although mainly associated with overhaul tasks is following a trend of continual degradation.

   135 pts. on 31 December 1973 vs. 166+ pts. on 28 September 1974.

Overhaul and Conversion

3. Overhaul performance has been extremely volatile but is trending to further degradation.

   144 pts. on 31 December 1973 vs. 210 pts. on 28 September 1974.

5A. Nuclear installation is an extremely welcome trend on overhauls as it has followed a solid downward trend.

   235 pts. on 31 December 1973 vs. 123 pts. on 28 September 1974.

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H. Boyd

GENERAL DYNAMICS
Electric Boat Division

SHIPYARD

WEEKLY MANAGEMENT REPORT

For Week Ending SEP 28 1974

Prepared by Department 635

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GENERAL DYNAMICS
Electric Boat Division

WEEKLY MANAGEMENT REPORT

WEEK ENDING SEP 28 1974

PAGE 1

INSTALLED AREA	INDIR. PERS-ONNEL	DIRECT CHARGING PERSONNEL					INSTALLED HOURS						PERF TO TARG (8) (8 ÷ 7)	% COVERAGE	BACK LOG (MAN-WEEKS)
		SUPV.	ELIG. ON ROLL 4+5+6	NOT INST-ALLED	INSTALLED		EARNED	PROG-RAMMED	NON PROG-RAMMED	STA-TION FILL	OVER-TIME	TOTAL (8+9+10)			
					PROG-RAMMED	STA. FILL									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
NEW CONSTRUCTION (CHART 2)	126	181	1714	198	1516	0	29065	43831	16608	0	7232	60439	151	73	-
OVERHAUL (CHART 3)	61	235	1645	994	651	0	9048	18791	8007	0	3762	26798	208	70	-
MANUFACTURING (CHART 4)	194	170	2318	694	1624	0	34935	44122	14496	0	3854	58618	126	75	-
NUCLEAR OPERATIONS (CHART 5)	34	128	787	350	437	0	8426	13372	3308	0	1883	16680	159	80	-
TESTING (CHART 6)	87	53	487	263	224	0	3869	6467	2891	0	1701	9358	167	69	-
OPERATIONS OFFICE & UNASSIGNED	+21	+31	+207	+207	0	0	-	-	-	-	-	-	-	-	-

TOTAL

SHIPYARD TOTAL (CHART 1)	523	798	7158	2706	4452	0	85343	126583	45310	0	18432	171893	148	74	-

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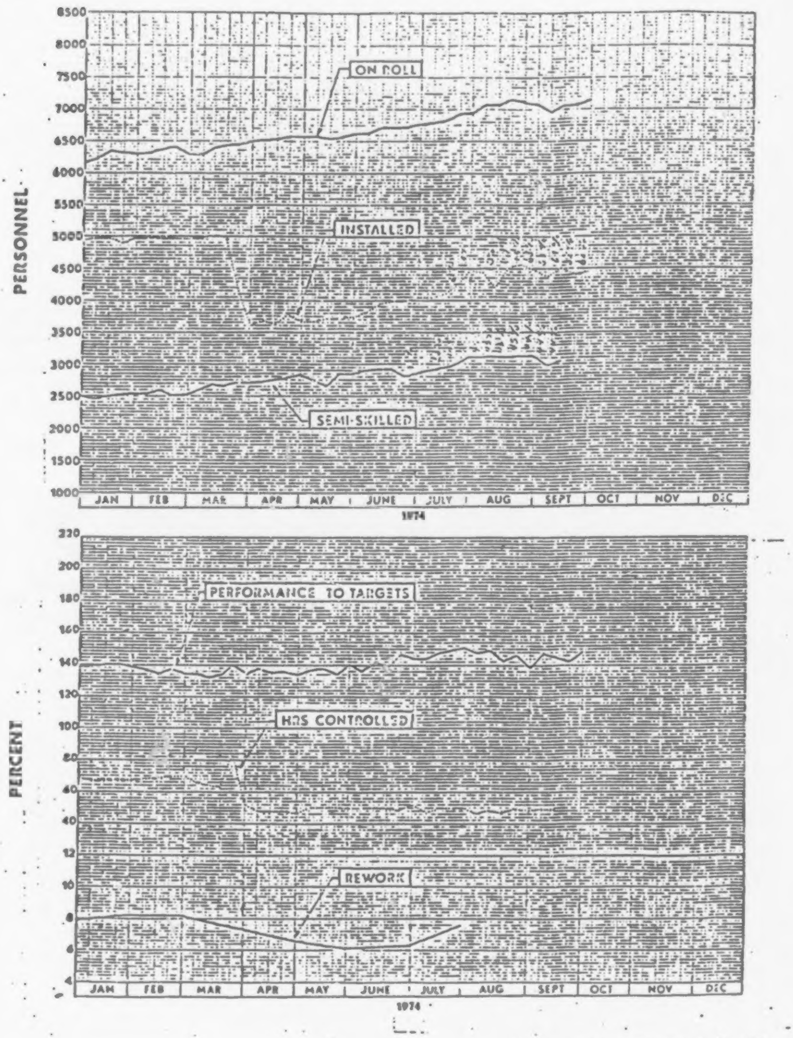

SHIPYARD
Direct Charging Non-Supervisory
CHART # 1 Week Ending 9-28-74

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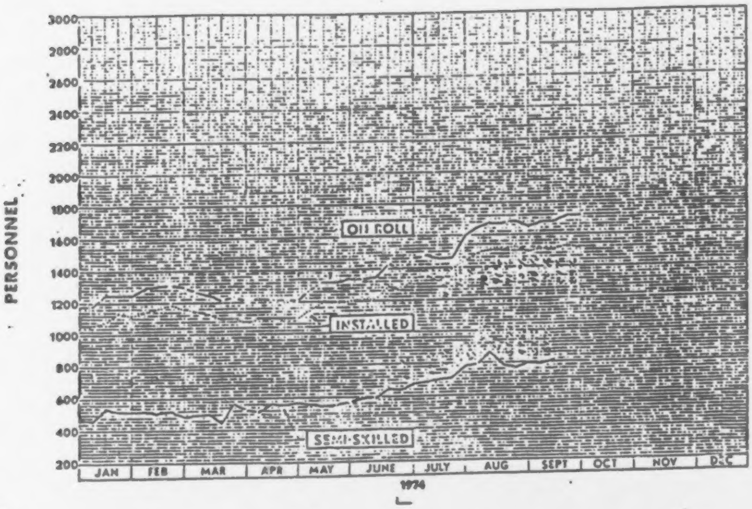

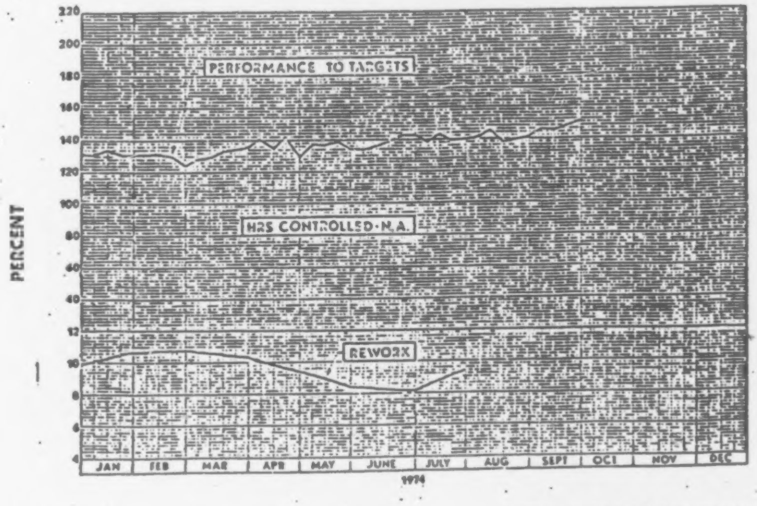

NEW CONSTRUCTION
Direct Charging Non-Supervisory
CHART № 2 Week Ending 9-28-74

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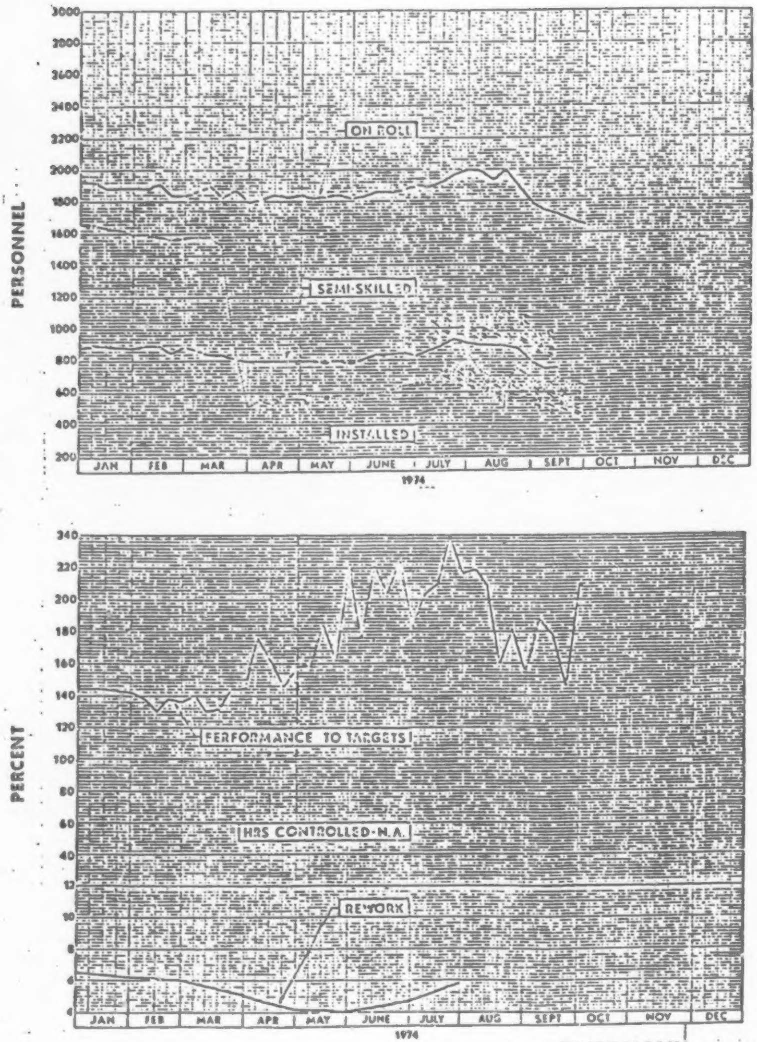
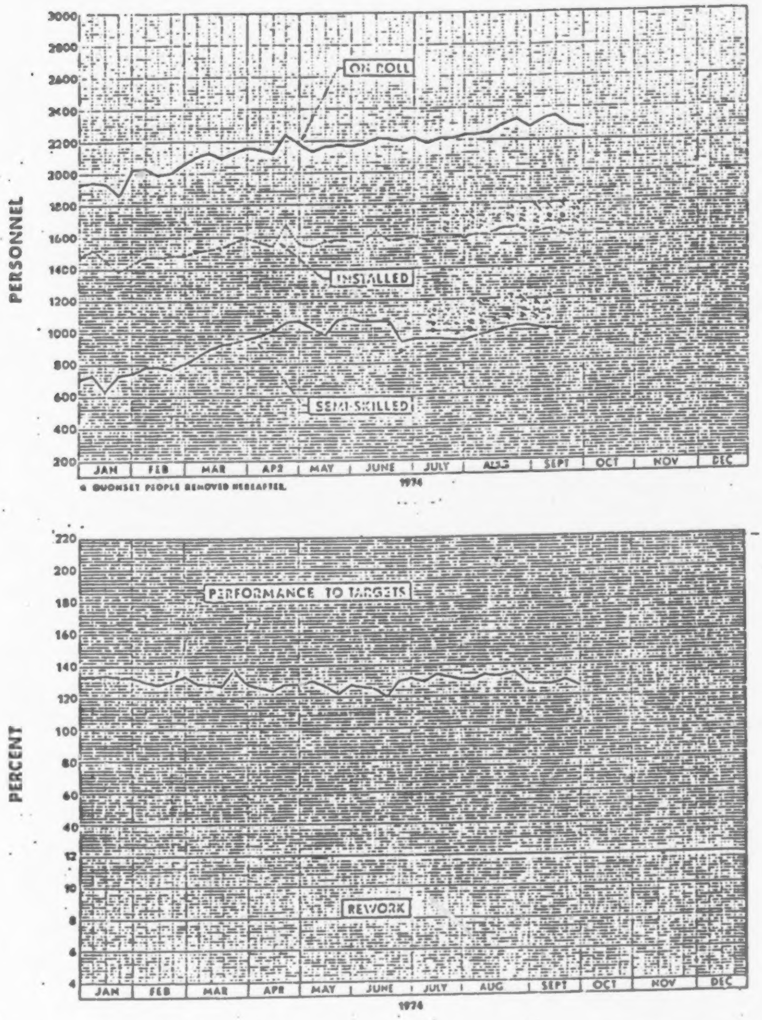


OVERHAUL
Direct Charging Non-Supervisory
CHART # 3 Week Ending 9-28-74



MANUFACTURING
Direct Charging Non-Supervisory
CHART # 4 Week Ending 9-29-74

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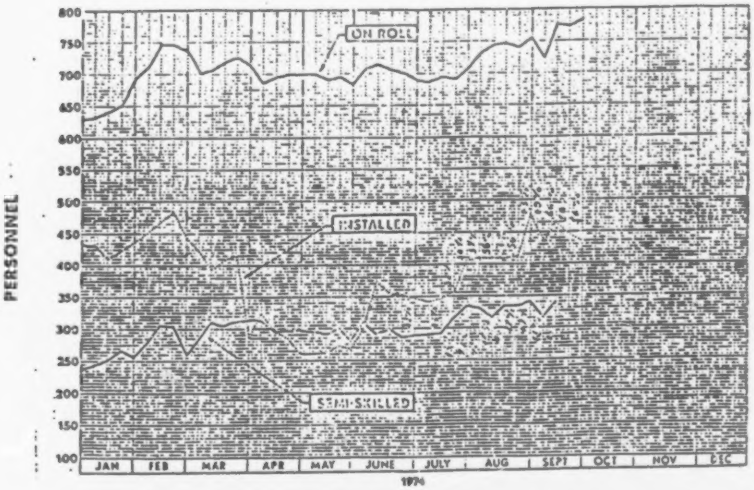

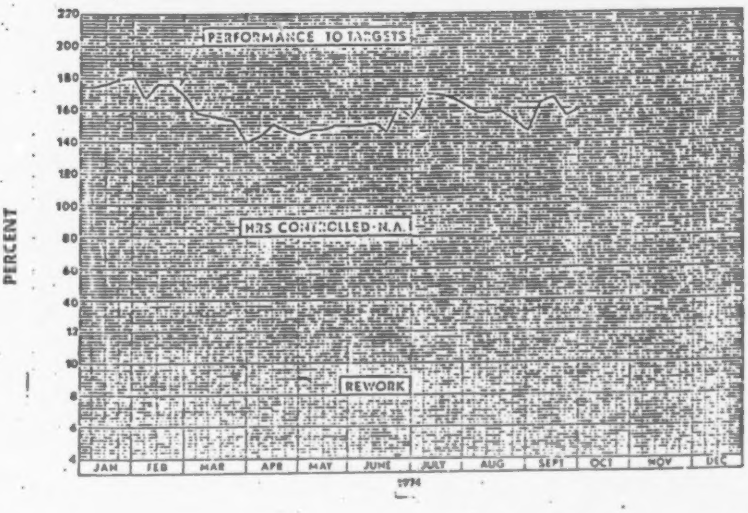

NUCLEAR
Direct Charging Non-Supervisory
CHART # 5 Week Ending 9-28-74

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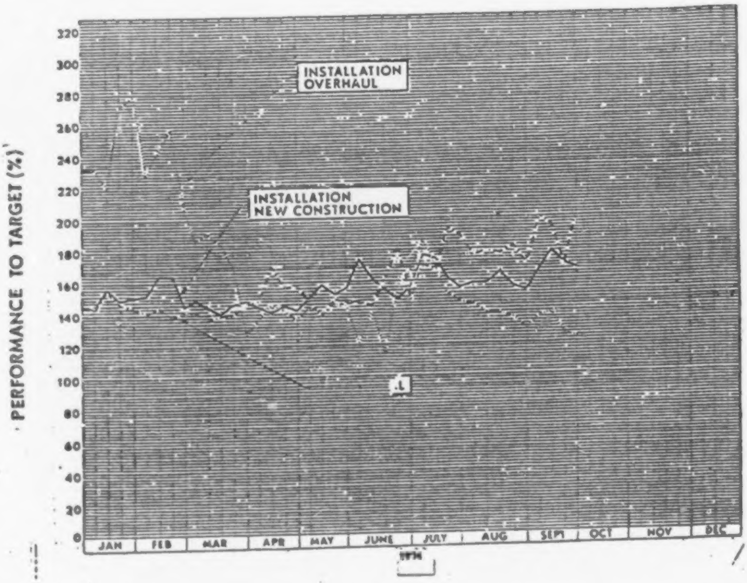

NUCLEAR
Direct Charging Non-Supervisory
CHART # 5A Week Ending 9-28-74

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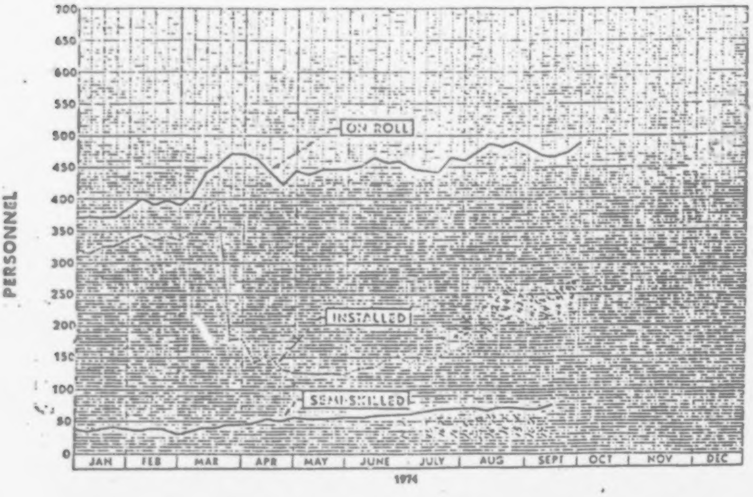

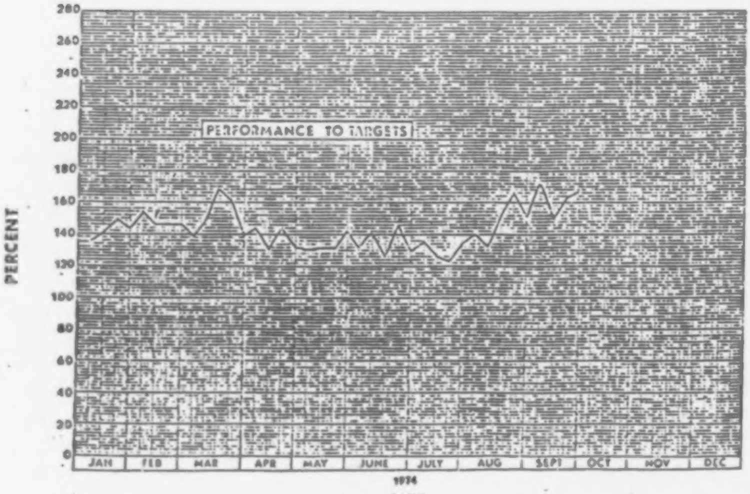

TEST

Direct Charging Non-Supervisory

CHART # 6 Week Ending 9-28-74

Attachment (B)
H. E. Boyd
9 October 1974

OVERHAUL COST SUMMARY

Ship	Contract Values[1] Cost	Fee	Total	Returns Thru 8/23/74	Corporate TIC[3]	Division TIC[2]
SSN-571	22,263	1,802	24,065	41,212	49,200	47,000
SSN-585	33,274	3,161	36,435	9,504	36,800	33,138
SSN-607	15,367	1,383	16,750	29,758	34,500	33,381
SSN-667	16,486	1,366	17,852	13,184	21,075	15,933
SSN-671	16,757	1,389	18,146	12,840	22,300	16,239
SSBN-616	28,836	2,595	31,431	44,765	47,500	46,100
SSBN-619	28,890	2,689	29,579	37,610	52,000	46,200

[1] Includes all changes currently in process at Electric Boat (including those not yet submitted.

[2] Division position is the current TIC and delivery data officially submitted to the Navy for overrun funding.

[3] Based on delivery dates shown on attached bar schedule.

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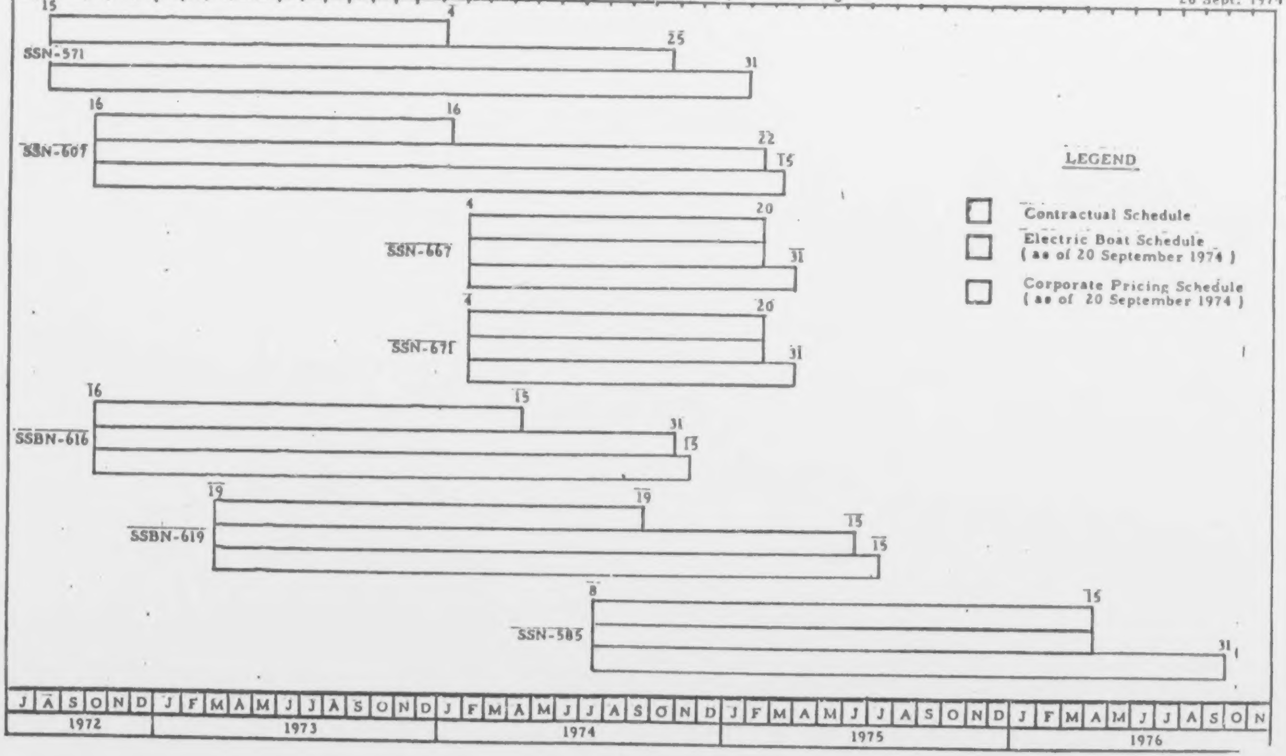
ELECTRIC BOAT OVERHAUL AND CONVERSION DELIVERY SCHEDULES
Contractual - Current Division - Corporate Pricing

H. E. Boyd
26 Sept. 1974



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Page 1 of 1
Issue Date 4 Oct. 1974
Replaces 3 July 1974
Prepared by
Corporate Pricing HEB

CONTRACT STATUS AS OF 23 August 1974
$(000's)

Division ELECTRIC BOAT
Program SSN-571 Overhaul
Contract No. N00024-71-C-0264

Contract Type CPIF
Contract Profit 5-8-12 %
Sharing Formula 80/20

CONTRACT BASELINE

	Cost	Profit	Price	Profit %
Total Negotiated	$ 19,968.8	$ 1,618.3	$ 21,587.1	8 %
Proposed - Not Negotiated	2,141.7	171.3	2,313.0	8 %
Estimated - Not Proposed	152.8	12.2	165.0	8 %
Total Contract	$ 22,263.3	$ 1,801.8	$ 24,065.1	8 %
Change from Last Report	$ 114.5	$ 9.0	$ 123.5	- %

Ceiling Price $ NA
Contract Go-Ahead 15 Aug. 1972
Contract Completion 4 Jan. 1974

REMARKS:

Disallowances calculated at .9%

COST STATUS

	Corporate	Division	Corporate Under (Over) Division
Actual Cost to Date	$ 41,212.0	$ 41,212.0	$ -
Estimate to Complete	7,988.0	5,788.0	(2,200.0)
Total Indicated Cost	$ 49,200.0	$ 47,000.0	$(2,200.0)
TIC Under(Over) Contract Cost	$(26,936.7)	$(24,736.7)	$(2,200.0)
Change from Last Report	$ (3,585.5)	$ (5,885.5)	$ 2,300.0
% Total Indicated Cost Expended	83.8 %	87.7 %	3.9 %
% Total Contract Cost Expended	185.1 %	185.1 %	- %
% Contract Task Completed	83.8 %	87.7 %	3.9 %
Indicated Completion Date	1/31/75	10/25/74	(3.25 Mos.)

PROFIT STATUS

	Corporate	Division	Corporate Over (Under) Division
Total Contract Profit	$ 1,801.8	$ 1,801.8	$ -
Profit Adjustments:			
Impact of Sharing	(688.6)	(688.6)	-
Underrun (Overrun)			
Disallowances	(442.8)	(423.0)	(19.8)
Total Indicated Profit	$ 670.4	$ 690.2	$ (19.8)
Profit Realization Forecast	1.36 %	1.47 %	(.11) %

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Page 1 of 1
Issue Date 4 October 1974
Replaces New
Prepared by
Corporate Pricing HEB

CONTRACT STATUS AS OF 23 August 1974
$(000's)

Division ELECTRIC BOAT
Program SSN-585 Overhaul
Contract No. N00024-73-C-0272

Contract Type CPIF
Contract Profit 6-9.5-13 %
Sharing Formula 80/20 Beginning @ $35.0M

CONTRACT BASELINE

	Cost	Profit	Price	Profit %
Total Negotiated	$ 33,105.9	$ 3,145.1	$ 36,251.0	9.5 %
Proposed - Not Negotiated	7.6	.7	8.3	9.5 %
Estimated - Not Proposed	160.8	15.2	176.0	9.5 %
Total Contract	$ 33,274.3	$ 3,161.0	$ 36,435.3	9.5 %
Change from Last Report	$ New	$ New	$ New	- %

Ceiling Price $ NA
Contract Go-Ahead 8 July 1974
Contract Completion 15 April 1976

REMARKS:

Disallowances calculated at .9%

COST STATUS

	Corporate	Division	Corporate Under (Over) Division
Actual Cost to Date	$ 9,504.0	$ 9,504.0	$ -
Estimate to Complete	27,296.0	23,634.0	(3,662.0)
Total Indicated Cost	$ 36,800.0	$ 33,138.0	$(3,662.0)
TIC Under(Over) Contract Cost	$ (3,525.7)	$ 136.3	$(3,662.0)
Change from Last Report	$ NA	$ NA	$ -
% Total Indicated Cost Expended	25.8 %	28.7 %	2.9 %
% Total Contract Cost Expended	28.6 %	28.6 %	- %
% Contract Task Completed	25.8 %	28.7 %	2.9 %
Indicated Completion Date	10/31/76	4/15/76	(6.5 Mos.)

PROFIT STATUS

	Corporate	Division	Corporate Over (Under) Division
Total Contract Profit	$ 3,161.0	$ 3,161.0	$ -
Profit Adjustments:			
Impact of Sharing	(360.0)	40.9	(400.9)
Underrun (Overrun)			
Disallowances	(331.2)	(298.2)	(33.0)
Total Indicated Profit	$ 2,469.8	$ 2,903.7	$ (433.9)
Profit Realization Forecast	6.7 %	8.76 %	(2.06) %

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CONTRACT STATUS AS OF 23 August 1974
$(000's)

Page 1 of 1
Issue Date 4 Oct. 1974
Replaces 3 July 1974
Prepared by Corporate Pricing HEB

Division ELECTRIC BOAT
Program SSN-607 Overhaul
Contract No. N00024-72-C-0255

Contract Type CPIF
Contract Profit 5-9-13 %
Sharing Formula 75-25 3

CONTRACT BASELINE

	Cost	Profit	Price	Profit %
Total Negotiated	$ 15,054.4	$ 1,354.9	$ 16,409.3	9 %
Proposed - Not Negotiated	56.4	5.1	61.5	9 %
Estimated - Not Proposed	256.0	23.0	279.0	9 %
Total Contract	$ 15,366.8	$ 1,383.0	$ 16,749.8	9 %
Change from Last Report	$ 8.9	$ .7	$ 9.6	- %

Ceiling Price $ NA
Contract Go-Ahead 16 Oct. 1972
Contract Completion 16 Jan. 1974

REMARKS:

Disallowances calculated at .9%

COST STATUS

	Corporate	Division	Corporate Under (Over) Division
Actual Cost to Date	$ 29,758.0	$29,758.0	$ -
Estimate to Complete	4,742.0	3,623.0	(1,119.0)
Total Indicated Cost	$ 34,500.0	$33,381.0	$ (1,119.0)
TIC Under(Over) Contract Cost	$(19,133.2)	$(18,014.2)	$ (1,119.0)
Change from Last Report	$ (644.5)	$ 9.3	$ (653.8)
% Total Indicated Cost Expended	86.3 %	89.1 %	2.8 %
% Total Contract Cost Expended	193.7 %	193.7 %	- %
% Contract Task Completed	86.3 %	89.1 %	2.8 %
Indicated Completion Date	3/15/75	2/22/75	(3 Weeks)

PROFIT STATUS

	Corporate	Division	Corporate Over (Under) Division
Total Contract Profit	$ 1,383.0	$ 1,383.0	$ -
Profit Adjustments:			
Impact of Sharing	(614.7)	(614.7)	-
Underrun (Overrun)			
Disallowances	(310.5)	(300.4)	(10.1)
Total Indicated Profit	$ 457.8	$ 467.9	$ (10.1)
Profit Realization Forecast	1.32 %	1.40 %	(.08) %

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CONTRACT STATUS AS OF 23 August 1974
$(000's)

Page 1 of 1
Issue Date 4 Oct 1974
Replaces 3 July 1974
Prepared by Corporate Pricing HEB

Division ELECTRIC BOAT
Program SSN-667 Overhaul
Contract No. N00024-73-C-0205
Contract Type CPIF
Contract Profit 5-8.2895-12 %
Sharing Formula 80/20

CONTRACT BASELINE

	Cost	Profit	Price	Profit %
Total Negotiated	$ 15,813.7	$ 1,310.9	$ 17,124.6	8.2895 %
Proposed - Not Negotiated	42.6	3.5	46.1	8.2895 %
Estimated - Not Proposed	629.5	52.2	681.7	8.2895 %
Total Contract	$ 16,485.8	$ 1,366.6	$ 17,852.4	8.2895 %
Change from Last Report	$ 208.9	$ 17.2	$ 226.1	-- %

Ceiling Price $ NA
Contract Go-Ahead 4 Feb. 1974
Contract Completion 20 Feb. 1975

REMARKS:

Disallowances calculated at .9%

COST STATUS

	Corporate	Division	Corporate Under (Over) Division
Actual Cost to Date	$ 13,184.0	$13,184.0	$ --
Estimate to Complete	7,891.0	2,749.0	(5,142.0)
Total Indicated Cost	$ 21,075.0	$15,933.0	$(5,142.0)
TIC Under(Over) Contract Cost	$ (4,589.2)	$ 552.8	$(5,142.0)
Change from Last Report	$ (5,026.1)	$ (524.1)	$(4,502.0)
% Total Indicated Cost Expended	62.6 %	82.7 %	20.1 %
% Total Contract Cost Expended	79.9 %	79.9 %	-- %
% Contract Task Completed	62.6 %	82.7 %	20.1 %
Indicated Completion Date	3/31/75	2/20/75	(5 Weeks)

PROFIT STATUS

	Corporate	Division	Corporate Over (Under) Division
Total Contract Profit	$ 1,366.6	$ 1,366.6	$ --
Profit Adjustments:			
Impact of Sharing	(542.3)	110.6	(652.9)
Underrun (Overrun)			
Disallowances	(189.6)	(143.4)	46.2
Total Indicated Profit	$ 634.7	$ 1,333.8	$ (699.1)
Profit Realization Forecast	3.01 %	8.37 %	(5.36) %

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Page 1 of 1
Issue Date 4 Oct. 1974
Replaces 3 July 1974
Prepared by Corporate Pricing HEB

CONTRACT STATUS AS OF 23 August 1974
$(000's)

Division ELECTRIC BOAT
Program SSN-671 Overhaul
Contract No. N00024-73-C-0205
Contract Type CPIF
Contract Profit 5-8.2895-12 %
Sharing Formula 80/20

CONTRACT BASELINE

	Cost	Profit	Price	Profit %
Total Negotiated	$ 16,073.6	$ 1,332.5	$ 17,406.1	8.2895 %
Proposed - Not Negotiated	43.3	3.6	46.9	8.2895 %
Estimated - Not Proposed	639.7	53.0	692.7	8.2895 %
Total Contract	$ 16,756.6	$ 1,389.1	$ 18,145.7	8.2895 %
Change from Last Report	$ 229.7	$ 19.0	$ 248.7	- %

Ceiling Price $ NA
Contract Go-Ahead 4 Feb. 1974
Contract Completion 20 Feb. 1975

REMARKS:

Disallowances calculated at .9%

COST STATUS

	Corporate	Division	Corporate Under (Over) Division
Actual Cost to Date	$ 12,840.0	$ 12,840.0	$ -
Estimate to Complete	9,460.0	3,399.0	(6,061.0)
Total Indicated Cost	$ 22,300.0	$ 16,239.0	$ (6,061.0)
TIC Under(Over) Contract Cost	$ (5,543.4)	$ 517.6	$ (6,061.0)
Change from Last Report	$ (6,620.3)	$ (559.3)	$ (6,064.0)
% Total Indicated Cost Expended	57.6 %	79.1 %	21.5 %
% Total Contract Cost Expended	76.6 %	76.6 %	- %
% Contract Task Completed	57.6 %	79.1 %	21.5 %
Indicated Completion Date	3/31/75	2/20/75	(5 Weeks)

PROFIT STATUS

	Corporate	Division	Corporate Over (Under) Division
Total Contract Profit	$ 1,389.1	$ 1,389.1	$ -
Profit Adjustments:			
Impact of Sharing	(551.3)	103.5	(654.8)
Underrun (Overrun)			
Disallowances	(200.7)	(146.2)	(54.5)
Total Indicated Profit	$ 637.1	$ 1,346.4	$ (709.3)
Profit Realization Forecast	2.86 %	8.29 %	(5.43) %

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CONTRACT STATUS AS OF 23 August 1974

$(000's)

Page 1 of 1
Issue Date 4 Oct. 1974
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Prepared by
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Division ELECTRIC BOAT
Program SSBN-616 Overhaul and Conversion
Contract No. N00024-71-C-0277

Contract Type CPIF
Contract Profit 6-9-12 %
Sharing Formula 80/20

CONTRACT BASELINE

	Cost	Profit	Price	Profit %
Total Negotiated	$ 28,491.6	$ 2,564.2	$ 31,055.8	9 %
Proposed - Not Negotiated	206.5	18.6	225.1	9 %
Estimated - Not Proposed	138.2	12.4	150.6	9 %
Total Contract	$ 28,836.3	$ 2,595.2	$ 31,431.5	9 %
Change from Last Report	$ 101.2	$ 9.1	$ 110.3	- %

Ceiling Price $ NA
Contract Go-Ahead 16 Oct. 1972
Contract Completion 15 Apr. 1974

REMARKS:

Disallowances calculated at .9%

Ship completed sea trials on 19 Sept. 1974 but requires an inserv trial and appears to be approximately 15 days short to Electric Boat schedule.

COST STATUS

	Corporate	Division	Corporate Under (Over) Division
Actual Cost to Date	$ 44,765.0	$ 44,765.0	$ -
Estimate to Complete	2,735.0	1,335.0	(1,400.0)
Total Indicated Cost	$ 47,500.0	$ 46,100.0	$(1,400.0)
TIC Under(Over) Contract Cost	$(18,663.7)	$ (17,263.7)	$(1,400.0)
Change from Last Report	$ (2,581.8)	$ (1,898.8)	$ (683.0)
% Total Indicated Cost Expended	94.2 %	97.1 %	2.9 %
% Total Contract Cost Expended	155.2 %	155.2 %	- %
% Contract Task Completed	94.2 %	97.1 %	2.9 %
Indicated Completion Date	11/15/74	10/31/74	(15 Days)

PROFIT STATUS

	Corporate	Division	Corporate Over (Under) Division
Total Contract Profit	$ 2,595.2	$ 2,595.2	$ -
Profit Adjustments:			
Impact of Sharing	(865.0)	(865.0)	-
Underrun (Overrun)			
Disallowances	(427.5)	(414.9)	(12.6)
Total Indicated Profit	$ 1,302.7	$ 1,315.3	$ (12.6)
Profit Realization Forecast	2.74 %	2.85 %	(.11) %

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Page 1 of 1
Issue Date 4 Oct. 1974
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CONTRACT STATUS AS OF 23 August 1974
$(000's)

Division ELECTRIC BOAT
Program SSBN-619 Overhaul and Conversion
Contract No. N00024-72-C-0245

Contract Type CPIF
Contract Profit 6-10-13 %
Sharing Formula 80/20

CONTRACT BASELINE

	Cost	Profit	Price	Profit %
Total Negotiated	$ 26,540.2	$ 2,654.0	$ 29,194.2	10 %
Proposed - Not Negotiated	156.0	15.6	171.6	10 %
Estimated - Not Proposed	193.8	19.3	213.1	10 %
Total Contract	$ 26,890.0	$ 2,688.9	$ 29,578.9	10 %
Change from Last Report	$ (789.7)	$ (79.1)	$ (868.8)	- %

Ceiling Price $ NA
Contract Go-Ahead 19 Mar. 1973
Contract Completion 19 Sept. 1974

REMARKS:

Disallowances calculated @ .9%

COST STATUS

	Corporate	Division	Corporate Under (Over) Division
Actual Cost to Date	$ 37,610.0	$37,610.0	$ -
Estimate to Complete	14,390.0	8,590.0	(5,800)
Total Indicated Cost	$ 52,000.0	$46,200.0	$(5,800.0)
TIC Under(Over) Contract Cost	$(25,110.0)	$(19,310.0)	$(5,800.0)
Change from Last Report	$ (6,589.7)	$ (789.7)	$(5,800)
% Total Indicated Cost Expended	72.3 %	81.4 %	(9.1) %
% Total Contract Cost Expended	139.8 %	139.8 %	- %
% Contract Task Completed	72.3 %	81.4 %	(9.1) %
Indicated Completion Date	7/15/75	6/15/75	(1 Month)

PROFIT STATUS

	Corporate	Division	Corporate Over (Under) Division
Total Contract Profit	$ 2,688.9	$2,688.9	$ -
Profit Adjustments:			
Impact of Sharing	(1,075.5)	(1,075.5)	-
Underrun (Overrun)			
Disallowances	(468.0)	(415.8)	(52.2)
Total Indicated Profit	$ 1,145.4	$1,197.6	$ (52.2)
Profit Realization Forecast	2.2 %	2.59 %	(.39) %

(24)

GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: Mr. A. M. Barton

Date May 15, 1975

FROM: T. S. Wadlow

FILE NO.:

SUBJECT: 688-I Costs

REFERENCE:

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Per your request, Cost Engineering has made a quick review of the 688-I cost picture and has concluded that the situation continues to be much the same as we forecast it to be in the "December 1974 Analysis." In this analysis the manhours that were forecast as being most probable at completion manhours were the following:

	EO1 + EO2	Other Ops	Engineering	Total Division
690	6,305	1,800	458	8,563
692	5,446	887	153	6,486
694	5,143	843	147	6,136
696	4,713	815	147	5,675
697	4,551	776	140	5,467
698	4,542	756	137	5,435
699	4,450	738	136	5,324
	35,150	6,615	1,321	43,086

The current forecast would differ from this primarily in that:

1) The disruption being seen on the 692, 694, 696, and 697 is greater than was forecast. Therefore, it will be necessary to add something like 900,000 hours to these ships.

2) The 699 is now going to be built on a slab at an additional cost of approximately 620,000 hours.

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3) The December estimate did not include claim preparation costs now estimated at 110,000 hours.

These additions should be spread as follows:

	E01 + E02	Other Ops	Engineering	Total Division
690		30	80	110
692	250			250
694	350			350
696	200			200
697	100			100
699	400	140	80	620
Total	1,300	170	160	1,630

The total labor hours are therefore:

$$\begin{array}{r} 43{,}086 \\ +\ 1{,}630 \\ \hline 44{,}716 \end{array}$$

The labor rate (including ODC, OT, Shift, and OH) used for the 20c schedule in the 1/6/75 St. Louis presentation was $11.99. For the 20d schedule the rate was $12.24. The Cost Engineering estimate is based on and is consistent with the 20d schedule. Financial Analysis' latest 20c pricing had a rate of $12.85. Therefore, it would be appropriate to use $13.10 to price the Cost Engineering estimate [12.85 + (12.24 - 11.99) = 13.10]

Therefore the labor cost is:

44,716 x 13.10 = $585.8 million

Material cost projections have been reviewed and the estimate of $213 million still looks accurate. Therefore, total costs expected are:

586 + 213 = $799 million

Revenue is currently projected at approximately $521 million; therefore resulting in a loss of (799 - 521) = $278 million if the REA is not considered.

The previous projected loss was $220 million. The increase of $69 million was caused as follows:

$40 million	- rates
19 million	- manhour increase
$69 million	- total

The manhour increases have been explained above. The rate increases were reviewed with Pete Wickham and were caused by several things. The principle cause was an overhead rate increase, but some phasing shifts and direct labor rate changes also occurred. Though time did not allow a precise reconciliation, we were satisfied that the new rate is reasonably accurate.

I would like to make one final comment regarding these forecasts. This is that, while we have and still do consider this to be a reasonable estimate of what these ships could and should cost under the circumstances that exist both in the shipyard, the outside economy, and with regard to the design the current performance does not support these forecasts on the latter ships. While I have relatively little doubt that we will not come in close to the 690 forecast, my concern increases on the latter ships. Current performance indicates that a substantial overrun will occur to these forecasts on the latter ships unless a considerable improvement occurs. I will repeat, however, that I feel these costs still can be met and do represent an outcome which I still feel is reasonably probable.

T. S. Wadlow

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GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: Mr. J. D. Pierce
Date November 4, 1975
FROM: A. M. Barton
FILE NO.:
SUBJECT: 1976 Plan
REFERENCE:

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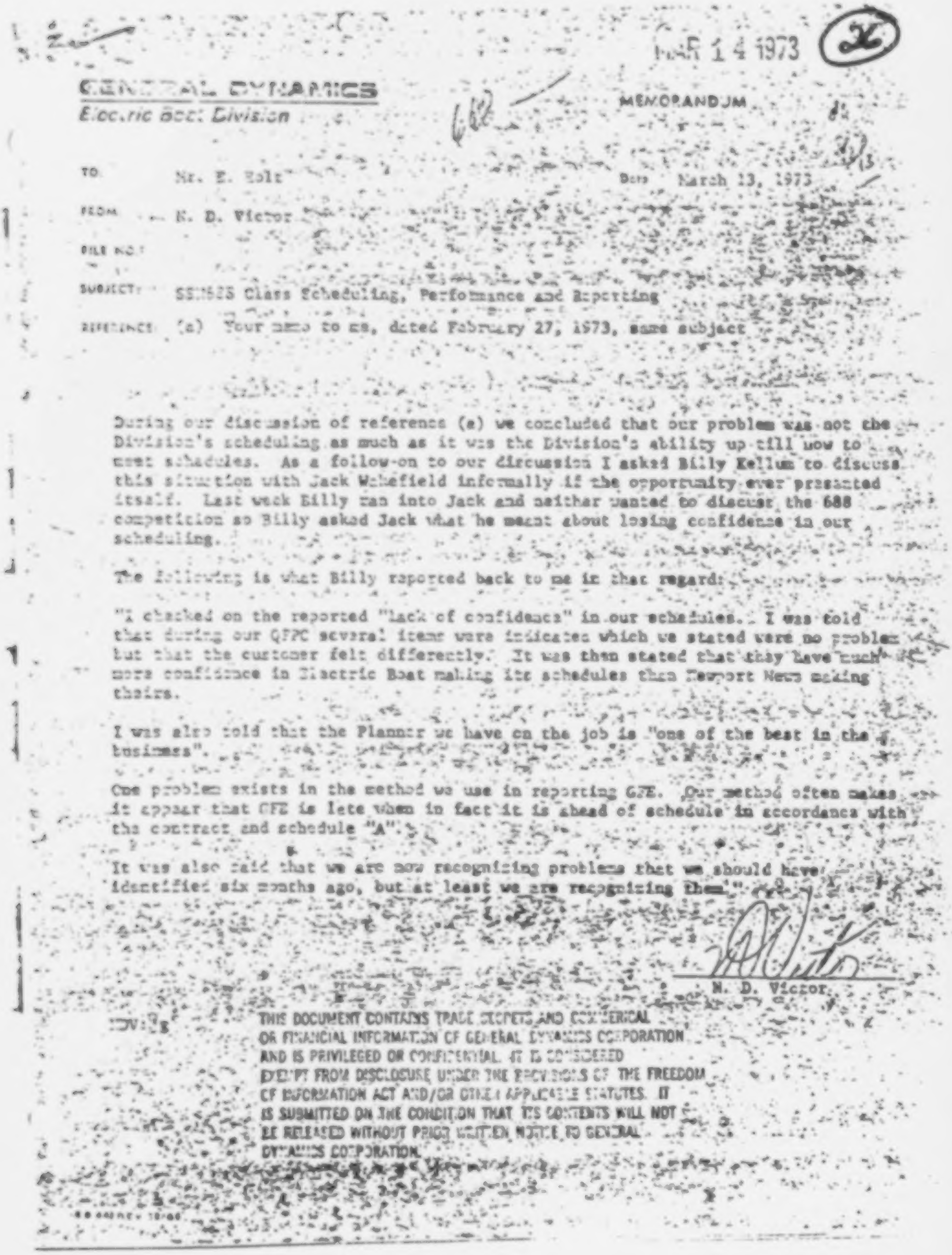
Two weeks ago, we discussed divorcing the manpower plan from the cost-to-complete system, and I agreed that as long as we intended to hire fewer people than the C-T-C would indicate, no problem existed. I must now reverse my position.

In reviewing the 1976 Plan, using the fourth quarter C-T-C statistics, it is evident that we have an enormous hiring problem. Assuming for a moment that a substantial part of this will not happen because we are going to hire 15 per cent fewer people, we, nevertheless, are back in the situation we were in in 1974. If you will recall, the 1975 Plan developed at year end 1974 was not considered a "real plan". Instead, the March 1975 Plan became the "real" EB plan. We seem to be repeating this with the fourth quarter C-T-C which should be used for the 1976 Plan. Much effort is spent developing cost control techniques, for example the overhead plan, which must start with detailed data which reflect the Division's goals for 1976. The detail is supposed to be the C-T-C. If we admit that the C-T-C is no good, this effort is wasted, and in fact, any systems designed to use the C-T-C as a control or a forecasting base is also wasted effort. This becomes clear when one is trying to determine the overhead costs we intend to control in the upcoming year. All of those costs which are considered variable with the shipyard and which are built off the C-T-C are meaningless if the Division's Manpower Plan is other than the C-T-C workload. In addition, all of our sales and profit forecasts obviously do not reflect the Division's intentions. What is worse, the C-T-C is supposed to be a communication device, and it really is communicating false information and top management is fostering this. It is requested that we re-examine our 1976 Plan and whatever it is we intend to do, factor it into something which represents a Division-wide communication medium intended to advise people of what the Division expects.

A. M. Barton

CC: Mr. M. C. Curtis
Mr. N. D. Victor



MAR 1 4 1973

GENERAL DYNAMICS
Electric Boat Division

688

MEMORANDUM

TO: Mr. E. Holt

Date: March 13, 1973

FROM: N. D. Victor

FILE NO.:

SUBJECT: SSN688 Class Scheduling, Performance and Reporting

REFERENCE: (a) Your memo to me, dated February 27, 1973, same subject

During our discussion of reference (a) we concluded that our problem was not the Division's scheduling as much as it was the Division's ability up till now to meet schedules. As a follow-on to our discussion I asked Billy Kellum to discuss this situation with Jack Wakefield informally if the opportunity ever presented itself. Last week Billy ran into Jack and neither wanted to discuss the 688 competition so Billy asked Jack what he meant about losing confidence in our scheduling.

The following is what Billy reported back to me in that regard:

"I checked on the reported "lack of confidence" in our schedules. I was told that during our QFPC several items were indicated which we stated were no problem but that the customer felt differently. It was then stated that they have much more confidence in Electric Boat making its schedules than Newport News making theirs.

I was also told that the Planner we have on the job is "one of the best in the business".

One problem exists in the method we use in reporting GFE. Our method often makes it appear that GFE is late when in fact it is ahead of schedule in accordance with the contract and schedule "A".

It was also said that we are now recognizing problems that we should have identified six months ago, but at least we are recognizing them."

N. D. Victor

NDV:gs

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SSN688 CLASS
NOVEMBER - DECEMBER
1974 REVIEW

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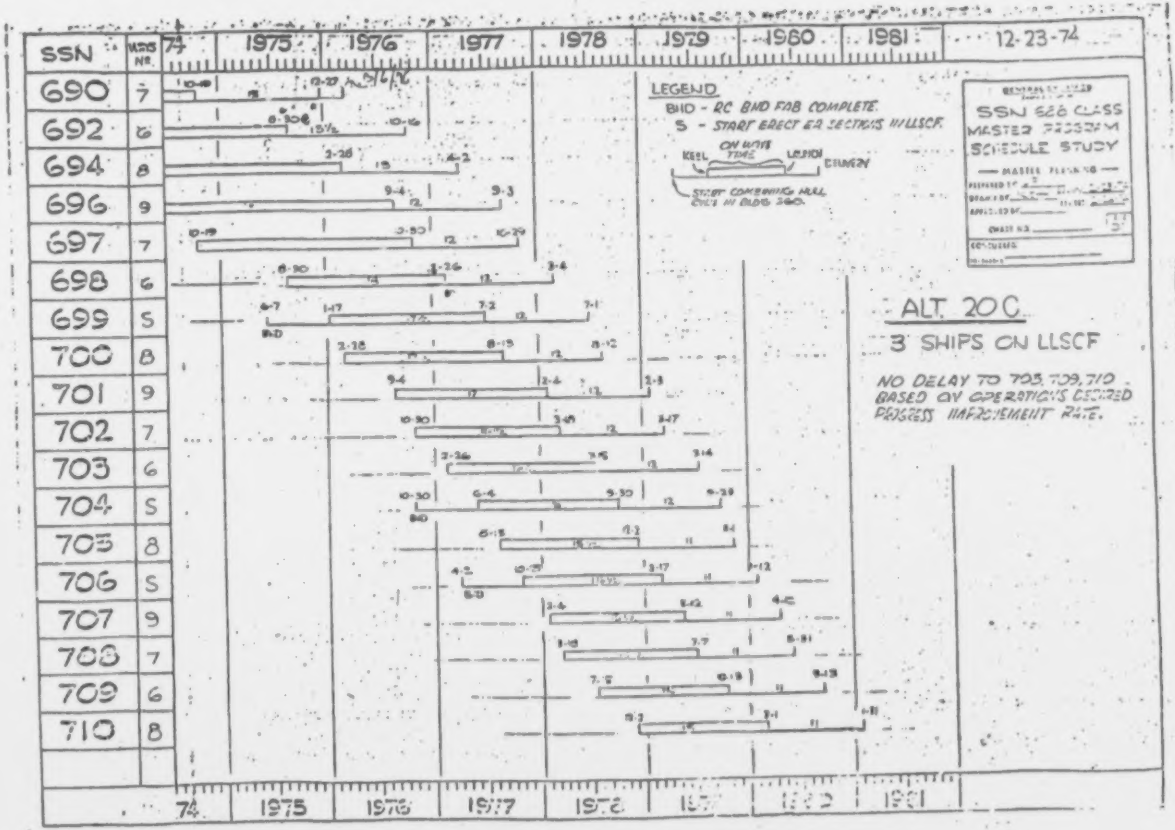

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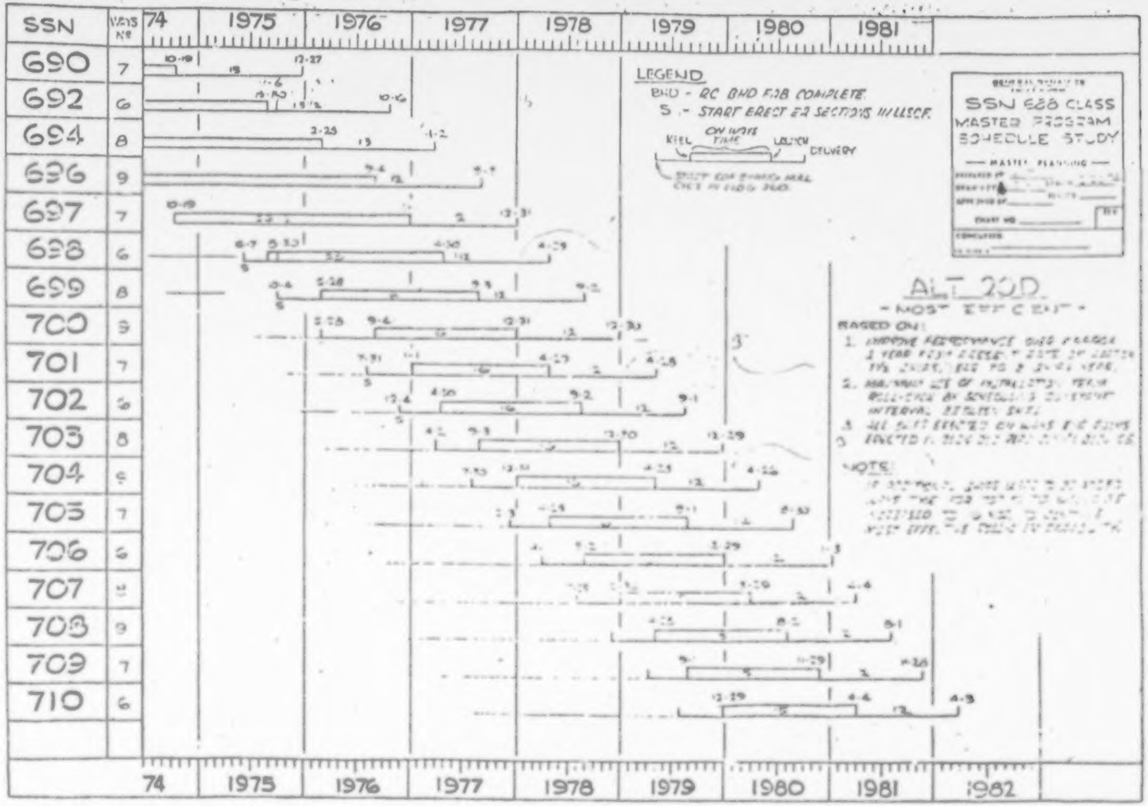

ALT. 20C - SSN688 CLASS PROGRAM SCHEDULE - COMMENTS

1. Three (3) ships on slab - with Trident program
2. Irregular intervals between ships
   A. Roll over problems
   B. Manufacture early and store to keep even manufacturing rate
3. Assumes potential CFE material problems on SSN700 Class will be resolved, e.g.,
   A. MSW valve castings
   B. Steam generator foundation castings
   C. Escape trunk castings
   D. Hull toroid section formed plates
   E. Hull transition ring machined plates
4. SSN701 and SSN702 are 1½ months apart.
5. SSN707 and SSN708 are 1½ months apart.
6. Delays SSN692 launch from 6/7/75 to 8/30/75.
7. Production rate increased from three (3) ships per year planned to over four (4) ships per year for about 2 years.
8. Assumes a learning curve for installation controlling path times as well as manhours to accomodate decreasing on-ways time.
9. Operations management does not consider that the manhours they have committed to for completing SSN688 Class are sufficient for this schedule.

12-23-74

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SSN688 CLASS PROGRAM

FIRST AND SECOND CONTRACTS

October 1974 Estimate at Completion

(000's)

	First Contract	Second Contract	Total
MANHOURS			
MACHINE SHOP/SHIPYARD	27,949	34,725	62,674
ENGINEERING	2,431	1,585	3,016
OTHER DIRECT	5,715	8,991	14,706
TOTAL MANHOURS	35,095	45,301	80,396
DOLLARS			
DIRECT LABOR	$ 191,311	$ 326,487	$ 517,798
DIRECT FRINGES	57,650	141,388	199,038
OVERTIME AND SHIFT	9,826	15,465	25,291
TOTAL DIRECT LABOR COST	$ 258,787	$ 483,340	$ 742,127
MATERIAL	$ 205,784	$ 372,467	$ 578,251
OVERHEAD	172,527	290,591	463,118
TOTAL COST	$ 637,098	$1,146,398	$1,783,496
	[illegible]	[illegible]	[illegible]
SALES	$ 513,755	$1,119,800	$1,633,555
PROFIT/(LOSS)	$(123,343)	$ (26,598)	$ (149,941)
	[illegible]	[illegible]	[illegible]

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Precedes "Yellow Book"

SSN688 FIRST AND SECOND CONTRACT COMPARISON OF COST ELEMENTS

	Original Contract	Subcontract/ Farmout	Schedule	Contract Changes	Inflation	Material and Manhour O/(U)	October 1974 Estimate
SSN688 FIRST CONTRACT							
Manhours (-000)							
Machine Shop and Shipyard	21,167	(2,089)	-	174	-	8,697	27,949
Engineering	1,031	-	-	4	-	396	1,431
Other Direct	4,841	-	-	18	-	856	5,715
TOTAL MANHOURS	27,039	(2,089)	-	196	-	9,949	35,095
Dollars ($-000)							
Direct Labor	140,087	(10,027)	5,411	989	756	54,095	191,311
Direct Fringe	42,054	(3,405)	1,631	290	992	16,088	57,650
Overtime and Shift	10,141	(543)	278	-	-	(50)	9,826
Material	139,479	26,277	-	56	32,575	7,397	205,784
Overhead	120,997	(9,359)	4,880	872	8,631	46,506	172,527
TOTAL COST (ESCALATED)	452,758	2,943	12,200	2,207	42,954	124,036	637,098
Escalation Recovery Inc./(Dec.)					(607)		
Sales	496,672						513,755
PROFIT/(LOSS)	43,914						(123,343)
SSN688 SECOND CONTRACT							
Manhours (-000)							
Machine Yard and Shipyard	30,436	-	-	-	-	4,289	34,725
Engineering	1,517	-	-	-	-	68	1,585
Other Direct	6,061	-	-	-	-	2,930	8,991
Program Manager Reserve	2,539	-	-	-	-	(2,539)	-
TOTAL MANHOURS	40,553	-	-	-	-	4,748	45,301
Dollars ($-000)							
Direct Labor	260,240	-	9,450	-	25,221	31,576	326,487
Overtime and Shift	20,890	-	447	-	-	(5,872)	15,465
Material	297,447	-	-	-	65,679	9,341	372,467
Overhead/ODC	276,609	-	12,503	-	109,017	33,850	431,979
TOTAL COST (ESCALATED)	855,186	-	22,400	-	199,917	68,895	1,146,398
Escalation Recovery Inc/(Dec.)					106,037		
Sales	937,059						1,119,800
PROFIT/(LOSS)	81,873						(26,598)

SSN688 FIRST CONTRACT

COMPARISON OF ESTIMATES

Machine Shop/Shipyard

(-000 HOURS)

Ship	Shipyard Target	Cost Engineering	February 1974 Budget
SSN690	5,800	6,010	4,261
SSN692	4,900	5,090	3,593
SSN694	4,100	4,730	3,157
SSN696	3,329	4,290	2,619
SSN697	3,271	4,160	2,539
SSN698	3,293	4,150	2,539
SSN699	3,256	4,030	2,523
TOTAL	27,949	32,460	21,231
February 1974 Budget	21,231	21,231	
Variance	6,718	11,229	

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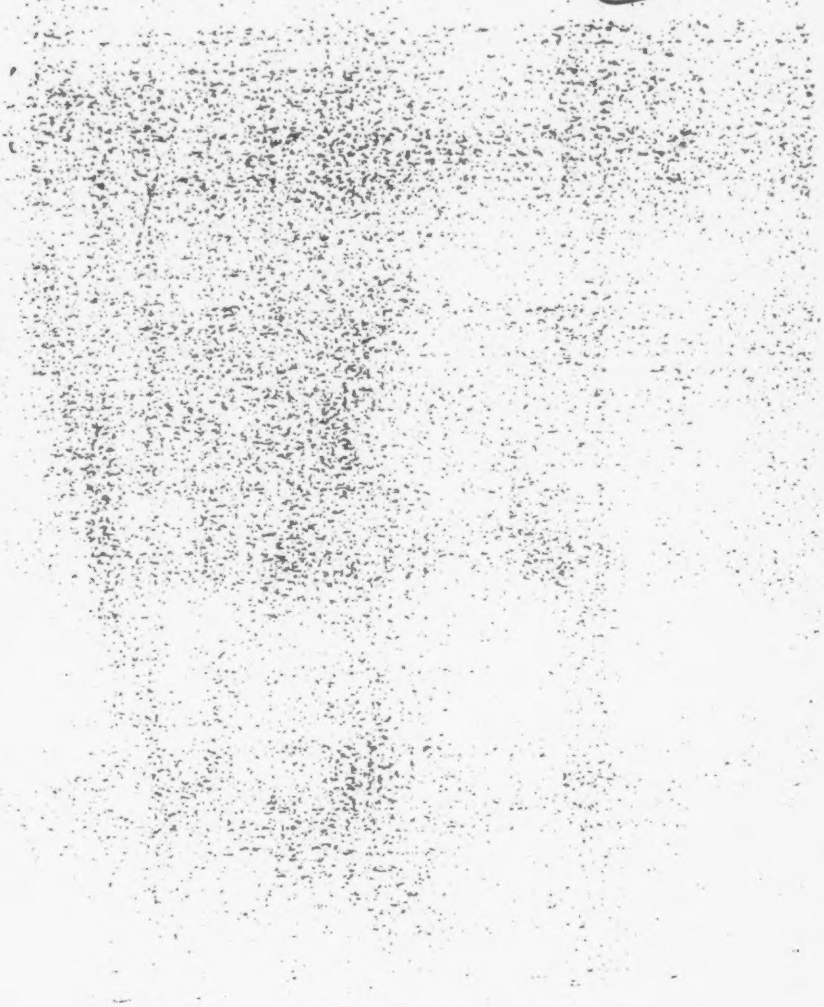

PROBLEMS ON THE 688 CLASS NOT CURRENTLY COVERED BY THE REA

To date, no recognition has been given to the downstream or dominal effect of the current problems on 0268, 0206. The current schedule, 20 C, shows the anticipated completion and delivery of the 699 and the 700 boat within one-month of each other. (699 [illegible] This delivery interval between two ships obviously creates a manpower problem. It is a continuation of an interval between the 696 and 697 which have delivery dates of 9/3 and 10/29 respectively. There is no way that EBDiv can perform to these schedules. Obviously, alter master program schedule, 20 D, provides for a four-month economical, reasonable contruction schedule should be implemented and followed immediately. If 20 C is followed, it necessitates developing two crews of tradesmen if there is insufficient interval to roll or phase manpower from ship to ship very economically. Some is possible, but we do not get the maximum benefits of direct labor learning trying to perform to unrealistic schedules. This schedule will cause EBDiv to hire an additional half of a work force to build the ship at this close an interval. Assuming that at a minimum we can accomplish this task at somewhere between 500 to 1,000 additional men and using the normal LOP associated with any new hire of 600 to 1,000 manhours skilled or semi-skilled would indicate that we are about to expend an additional 300,000 manhours to 1,000,000 manhours. This does not include the LOP associated with a drastic change in the percent of semi-skilled employees that would be necessary to meet this manpower requirement ~~A~~s evidenced by our build-up in 1973 and 1974, and our very few skilled tradesmen available. The large percentage, therefore, will come from the

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semi-skilled market and the work force will be that much less efficient.

Further compounding this problem is the fact that the Trident currently is beginning to develop its own work force over the same time frame which will require at least 50% of the experienced work force for new construction to be married with additional new employees which again will be for the majority part semi-skilled, inexperienced employees. The replacement for these employees diverted to the Trident program from the 688 Class program will also be sorely felt because those people diverted will again be replaced with semi-skilled new employees. This assumes that we will maintain some overhaul work if we do not accept any more overhaul work phasing out by 1977. Some of the impact above may be offset by using installation trades from the overhaul work from the latter half of construction from the Trident program.

It is apparent that we instantly, as soon as possible, after negotiations of the 3rd contract for the 688 contract are concluded, issue a revised construction schedule which reflects alternate 20 D which would prevent the necessity of having to hire an additional half of a work force for the 688 class and would minimize the impact of the Trident program somewhat.

At least the manhours associated with the additional manpower for the 688 class is a legitimate cost item for including in the REA or a future claim.

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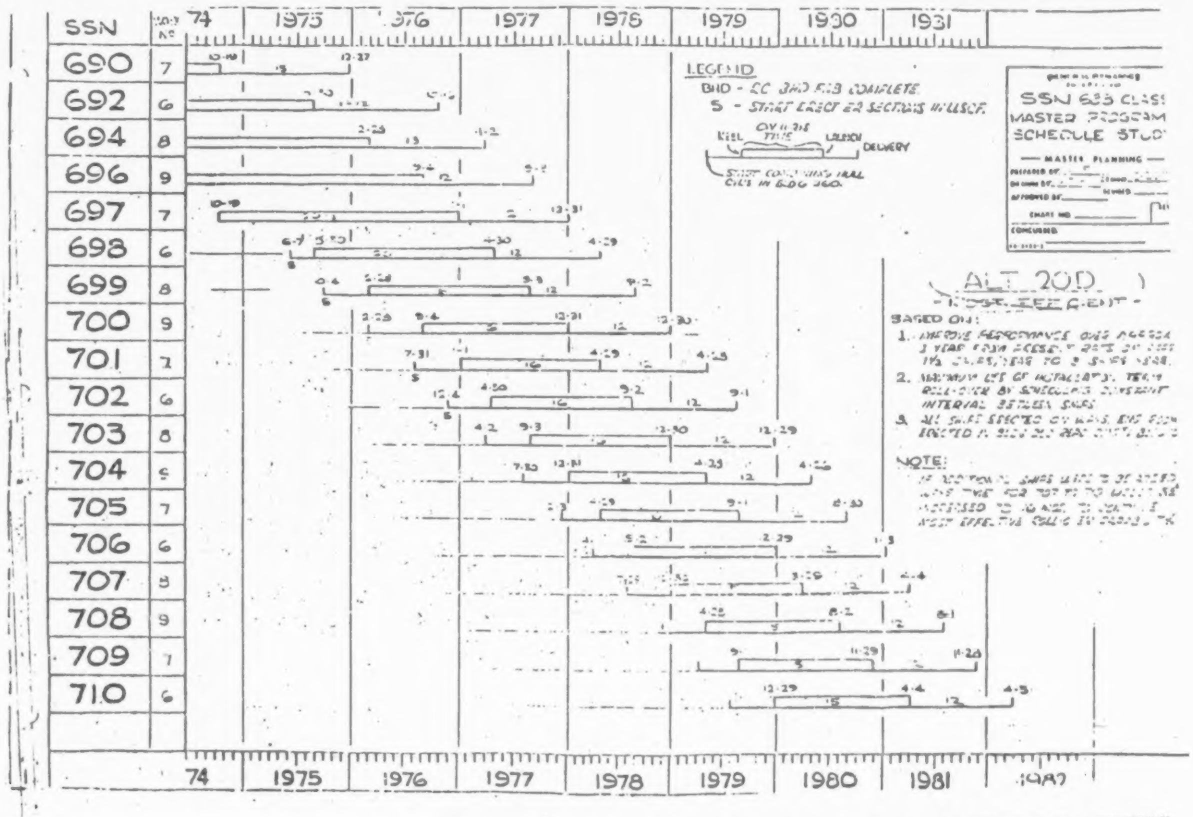

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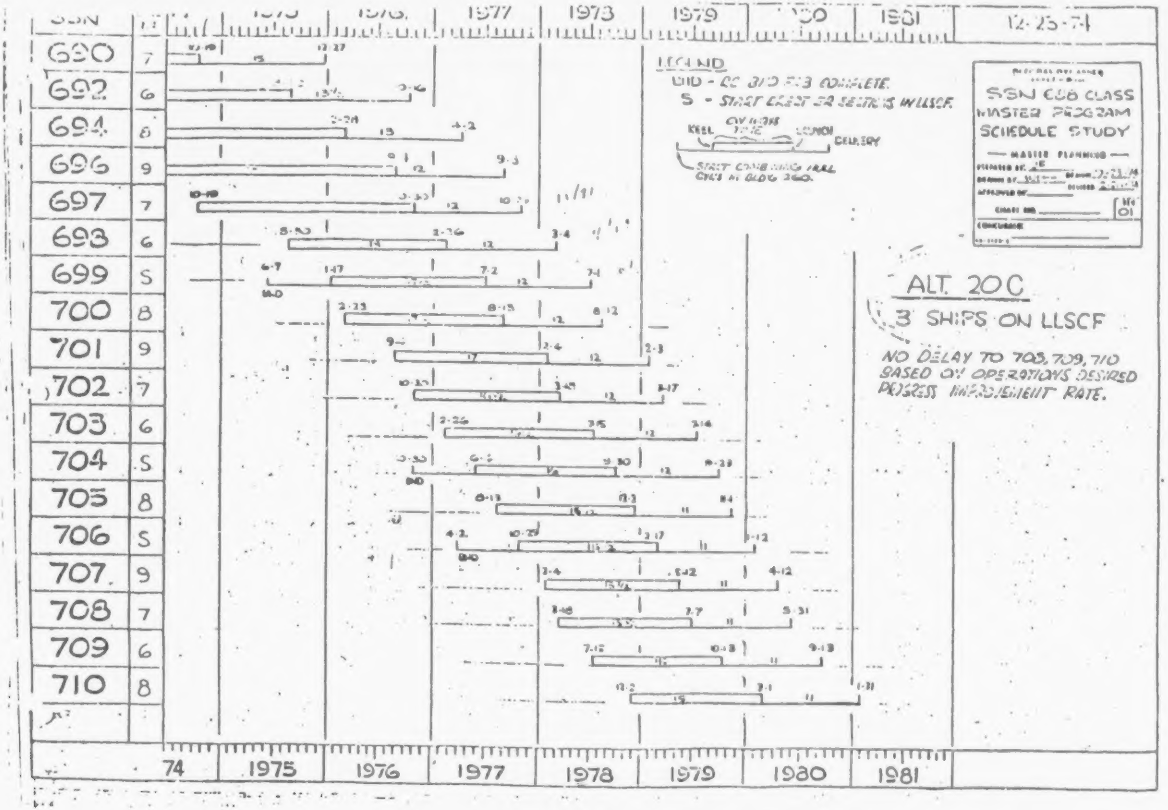

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688 Class MASTER PROGRAM SCHEDULE
STUDY alt 20D & 20C Schedules

(29)

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SSN688 CLASS
CONSTRUCTION
PROGRAM REVIEW

GENERAL DYNAMICS
Electric Boat Division

6 January 1975

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SSN688 CLASS PROGRAM

ENCLOSED ARE VARIOUS MANHOURS, LABOR RATES, AND OVERHEAD RECONCILIATIONS TO THE BASIC CONTRACTS IN THIS PROGRAM. WHILE THE PRICING TECHNIQUES USED HAVE NOT VARIED FROM THE BIDS, MANY OF THE ELEMENTS HAVE.

BOTH CONTRACTS NOW HAVE A SUBSTANTICAL SUBCONTRACT/FARMOUT PROGRAM.WHILE BOTH HAVE BEEN IMPACTED BY INFLATION AND SCHEDULE CHANGES, THE SCOPE, DISRUPTION, SKILL MIX IMPACTS HAVE BEEN EQUALLY AS SIGNIFICANT.

THE SSN688 FIRST CONTRACT HAS BEEN AFFECTED BY TWO CHANGES IN ACCOUNTING; SUPERVISION AND PROCUREMENT CHANGED FROM AN OVERHEAD TO A DIRECT CHARGE AND DIRECT FRINGES WERE TAKEN FROM OVERHEAD AND MADE AN OTHER DIRECT COST (ODC).

THE METHOD OF CALCULATING LABOR ESCALATION RECOVERY HAS BEEN MODIFIED SUCH THAT WE ARE NOW FORECASTING THE BLS INDEX TO GROW AT THE SAME RATE AS PROJECTED FOR ELECTRIC BOAT DIVISION BUT TO LAG ELECTRIC BOAT DIVISION'S GROWTH BY ONE YEAR.

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SSN688 CLASS PROGRAM
Comparison of Cost Elements

	Original Contract	Subcontract/ Farmout	Contract Changes	Schedule Economics	Inflation	Charging Change	Scope, Disruption, Skill Mix, etc.	Other	Dec Ana
SSN688 FIRST CONTRACT									
Manhours (-000)									
Machine Shop/Shipyard	21,167	(2,090)	174			1,498	13,281	1,120	3
Engineering	1,031		4				286	-	
Other Direct	4,841	-	18	-	-	100	1,276	380	
Total Manhours	27,039	(2,090)	196	-	-	1,598	14,843	1,500	4
Dollars ($-000)									
Direct Labor	140,087	(9,677)	989	14,838	14,013	10,387	71,335	(8,866)	23
Direct Fringe	42,054	(2,903)	290	4,451	5,165	3,116	21,401	(2,660)	7
Shift/Overtime	10,141	(434)	-	1,068	1,009	752	5,136	(5,242)	1
Material	139,479	29,432	56	9,750	20,833	-	11,734	1,500	21
Overhead	120,997	(8,632)	872	14,285	14,561	(14,255)	61,633	21,120	21
Total Cost (Escalated)	452,758	7,786	2,207	44,392	55,581	-	171,239	5,852	73
Escalation Recovery	83,729				5,823				8
Sales	496,672								51
Profit/(Loss)	43,914								(22
SSN688 SECOND CONTRACT									
Manhours (-000)									
Machine Shop/Shipyard	30,436	(2,750)	-	-	-	-	15,996	1,760	45
Engineering	1,517	-	-	-	-	-	13	-	1
Other Direct	6,061	-	-	-	-	-	1,719	240	8
Reserve	2,539	-	-	-	-	-	(2,539)	-	
Total Manhours	40,553	(2,750)	-	-	-	-	15,189	2,000	54
Dollars ($-000)									
Direct Labor	260,240	(21,368)	-	15,712	37,532	-	95,554	37,791	427,
Direct Fringe	82,922	(8,257)	-	5,012	42,318	-	30,482	12,693	165,
Shift/Overtime	20,890	(949)	-	1,257	2,785	-	7,644	(12,669)	18,
Material	297,447	60,834	-	11,000	98,315	-	23,400	2,000	492,
Overhead	193,687	(18,543)	-	25,742	21,954	-	71,092	77,020	370,
Total Cost (Escalated)	855,186	11,717	-	58,723	202,904	-	228,172	118,835	1,475,
Escalation Recovery	167,137				210,239				377,
Sales	937,059								1,224,
Profit/(Loss)	81,873								(251.

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SSN688 CLASS PROGRAM

Retarget Comparisons

($-000)

	SSN688 First Contract		SSN688 Second Contract	
	20c	20d	20c	20d
Manhours	34,680	33,220	42,151	40,611
Labor Cost	415,717	406,741	684,959	725,174
Material Cost	205,784	205,784	470,996	481,996
Total Cost	621,501	612,525	1,155,955	1,207,170
Sales	519,612	519,612	1,208,868	1,224,160
Profit/(Loss)	(101,889)	(92,913)	52,913	16,990
Escalation Recovery	89,552	89,552	377,376	377,376

SSN688 CLASS PROGRAM

Comparison Sheet

($-000)

Schedule	Yellow Book	Retarget		December 1974 Analysis	
	Alt. 5	20c	20d	20c	20d
SSN688 First Contract					
Manhours	33,819	34,680	33,820	43,086	43,086
Material	205,784	205,784	205,784	212,784	212,784
Profit/(Loss)	(102,092)	(101,889)	(92,913)	(218,164)	(220,203)
SSN688 Second Contract					
Manhours	45,301	42,151	40,611	54,992	54,992
Material	410,162	470,996	481,996	481,996	492,996
Profit/(Loss)	40,067	52,913	16,990	(152,137)	(251,377)
Total					
Manhours	79,120	76,831	74,431	98,078	98,078
Material	615,946	676,780	687,780	694,780	705,780
Profit/(Loss)	(62,025)	(48,976)	(75,923)	(370,301) ✓	(471,580)

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SSN688 CLASS PROGRAM

Direct Labor Rate Reconciliation

	SSN688 First Contract		SSN688 Second Contract	
Bid Rate		$5.18		$6.42
Supervisor/Procurement Change	7¢		-	
Greater Percent of Trade Hours	(14¢)		(11¢)	
Inflation	46¢		68¢	
Schedule	35¢		29¢	
Mix	(51¢)		49¢	
Sub-Total	23¢		$1.35	
December 1974 Analysis		$5.41		$7.77

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SSN688 CLASS PROGRAM - ECONOMICS

Bid vs December 1974 Analysis

(% Increase)

	1971	1972	1973	1974	1975	1976	1977	1978
MTC								
SSN688 First Contract	5.0	7.0	5.0	5.0	5.0	7.0	5.0	
SSN688 Second Contract			6.0	6.0	8.0	7.0	7.0	8.0
Current	5.0*	7.5*	6.0*	6.0*	18.5	6.5	6.0	11.0
COLA							5¢	
MDA								
SSN688 First Contract	3.5	5.0	7.0	5.0	5.0	5.0	7.0	
SSN688 Second Contract			7.5	6.5	6.0	8.0	7.0	7.0
Current	3.5*	5.0*	7.5*	6.0*	6.0*	18.0	7.0	6.5
COLA					7¢*	11¢*		

The MDA Union package of 1973 resulted in slightly higher rates than bid. With the dropping of Government controls the anticipated rates for 1975 and forward are expected to be considerably higher. This is born out by Union packages already negotiated by other companies (see next chart).

* Per existing contract.

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SSN688 CLASS PROGRAM

Union Increase Comparisons

	% of Base Pay				
	1974	1975	1976	1977	COLA (CPI)
ELECTRIC BOAT DIVISION					
MDA,	6.0*	6.0*	18.0	7.0	1¢ for each 0.5 pts. - each year - 1/3 annual increase max per year
COLA	-	7¢*	11¢*	-	
MTC	6.0*	18.5	6.5	6.0	
COLA	-	-	-	5¢	
QUINCY DIVISION	21.1*	6.8*	6.3*		N/A
UNITED AIRCRAFT CORPORATION	14.0*	3.0*	3.0*		1¢ for each 0.3 pts. growth - every 6 months - 20¢ max per 6 months
WEST COAST (6 YARDS)	13.6*	8.5*	7.9*		1¢ for each 0.4 pts. - uncapped
CANADIAN	25.0*	11.0*			1¢ for each 0.3 pts.
LITTON	13.3*	4.9*	4.7*		COLA* second year--1¢ for every .5 points increase over 10 points growth. Third year--1¢ for every .4 points increase over 8 points.

*per Existing Contract

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SSN688 FIRST AND SECOND CONTRACTS

OVERHEAD VARIANCE ANALYSIS

Bid vs Schedule 20d

($000's)

	SSN688 First Contract			SSN688 Second Contract		
	Direct Labor	Overhead	Overhead %	Direct Labor	Overhead	Overhead
Contract Baseline	$140,087	$120,997*	86.4	$260,240	$193,687	74.4
Direct Labor Related	93,019	68,464		167,221	129,250	
Facilities		3,910			18,525	
Manpower, Training, Recruitment		10,913			7,753	
Tooling		3,175			7,052	
Indirect Fringes		1,782			11,480	
Data Processing		517			1,680	
Miscellaneous		823			925	
Total	$233,106	$210,581	90.3	$427,461	$370,952	86.8

688 CONTRACTUAL PLAN

The following course of action is designed to deal with both the cash problem and the profit loss problem in terms of the entire 688 program.

STEP 1 - Negotiate an amendment to the 688-I contract which will:

a) Revise the escalation article to be essentially the Trident clause.

b) Eliminate the overhead ceiling.

c) Reduce the payment withholding amount.

COMMENT - While there has been conversation which would indicate a willingness on the part of the Navy to enter into such an agreement on other than equal legal consideration basis, there is no indication whatever in the negotiations with the Contracting Officer that the Navy will in fact proceed in that manner. On the contrary, the approach has been to try to set up a legal consideration equation which would extract from the company a release of future claims which would balance on a dollar for dollar basis the estimated value to the company of items a), b) and c) above. This equation has been set up by the Navy in the first instance to require a total release of all entitlement to claims to date on 688-I. The Electric Boat Division dollar assessment of the values is indicated below:

Eliminate O'hd Ceiling	+	Progress Payment Changes	+	Trident Escalation	=	Total Release
$25 M	+	$5 M	+	$60 M	=	$288 M (undiscounted but limited to 2/74 schedule)

The Contracting Officer has flatly ruled out the possibility of also amending 688-II contract at this time, and it is not known whether there is a controlling reason for this position. Electric Boat Division pointed out the discrepancy in the values on the two sides of the equation, and suggested trying to achieve a balance by also raising the contract ceiling to something in the neighborhood of 145%. The Navy discussed this approach in terms of anything over 120% being an excessive evaluation of the claim potential. Since Navy funding problems are presumed to be a part of the Navy's position on this, Electric Boat Division has concentrated on an effort to balance the equation by leaving out the contract ceiling adjustment for the time being, and instead cutting down the amount released to a portion of future claims only. A draft of such a release has been offered to and rejected by the Navy. A summary evaluation of the cost given up by this partial release is:

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Economics of delay	$ 65 M
Time related services	15 M
Disruption (re above)	1 M
Known Constructive Changes	3 M
Subcontracting Premium	11 M
(Other)	1 M
Risk	10 M
Interest	10 M
Total Cost	$116 M

CONCLUSIONS, STEP 1 - Timing constraints on claim settlement, or even a partial payment on account of claims, are so severe that there is no acceptable alternative to pursuing Step as quickly as possible. To do this will require a new schedule and associated cost to complete at this time, and a determination to escalate the negotiations as high as necessary in the Navy to accomplish this. It also must be assumed that in order to succeed there must be either an actual equivalence of legal consideration, or at least an approximation and appearance thereof. A goal for completion of Step 1 is set at 3/1/75.

STEP 2 - Submit 688 claims as follows:

a) Submit initial 688-I claim if satisfactory Step 1 settlement not achieved by 3/1/75.

b) Notify Navy of 688-II claim.

c) Supplement 688-I claim.

d) Submit 688-II claim.

e) Settle 688-I and 688-II claims.

COMMENT - The effort to date has been on 688-I only and founded on the 2/74 schedule, because that was the only one available. It is clear that if this claim is submitted as planned by 2/1/75, it will have to be supplemented soon thereafter to reflect a later schedule.

As a result of the claim work to date, it has also become clear that the preponderance of the claimable amount for both flights, and particularly the second flight, is based on the low quality of the NPN design with a resultant increase in the scope or amount of work to be accomplished by the shipbuilders. In order to be able to substantiate this large amount, a significant detailed critical review of the entire NPN detail design will be required.

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A second factor controlling the time of submittal of a 688-II claim is the timing of recognition of a schedule and cost-to-complete which will support a claim. It is expected that the initial 688-I claim will establish that there is a valid entitlement basis, and that the amount is substantial. It is planned to be ready for submittal by 2/1/75. However, the timing of submittal is dependent upon satisfactory resolution of Step 1 negotiations.

✓ STEP 3 - A highly profitable third flight contract is essential to financial recovery of the program as a whole, because it is unrealistic to assume a recovery, through claims, of substantially all of a big cost over-run. In order to be able to get an award on a basis which will serve this purpose, the cost estimate will necessarily have to be conservative, and the terms and conditions remove as much risk as possible.

It is planned to submit the proposal on time, 1/30/75, with provision for reset of cost and ceiling (tantamount to price redetermination) at time of launch of the first ship of 688-III (1980)...

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Mr. R. Gurvine

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GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: N. D. Victor

Date: June 18, 1976

FROM: G. E. MacDonald

FILE NO.:

SUBJECT: SSN 688 Class Schedule Review

REFERENCE

Subsequent to the MTC strike, the Division developed schedules for completion of the SSN 688 class ships. This schedule, characterized as 22F, was a "best efforts" schedule to enable the Company to deliver the ships as early as practicable. Since the formulation of this schedule, it is evident that some key events are being accomplished later than contemplated by the 22F Schedule. While it is the Division' intention to continue to strive to deliver SSN 688 class ships in accordance with the 22F Schedule or as close to it as possible, it is appropriate at this time to develop a second schedule which reflects a more normal shipbuilding effort. This second schedule should be a reasonably conservative approach including contingencies, and should take into account the following conditions and assumptions:

(a) Conditions and schedule status as they exist today.

(b) All the basic producibility problems inherent in the Newport News design which make the ships difficult to build.

(c) Continued high rate of design and engineering changes will continue for at least four months after SSN 688 (lead ship) delivery.

(d) SSN 688 will not go to sea until late June 1976. The sea trial period will be extended in direct proportion to the percentage increase in time between the actual launch date and the actual sea trial date as opposed to that scheduled (i.e., a 46% increase in time equals delivery about December 1, 1976).

(e) Major changes to correct bad features of the design plus state of the art changes, such as MSW valves replacement, forward compartment rearrangement, etc., will not permit the design to stabilize on a "standard" ship until SSN 703 at the earliest.

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(f) Current ship status, continuing engineering problems, InSurv Cards, Unsats, etc., plus time for corrected drawings to be sent by the Design Agent, will not permit delivery of SSN 690 until at least five months after SSN 688 (or about April 1977).

It is not the intent of this request to ascertain when in fact the ships will be delivered in view of the Division's "best efforts" to deliver these ships in the earliest possible time frame.

The schedule review should provide factual detail in support of the delivery dates reflected in the second schedule and should also contain sufficient data to permit assessment of the reasons for the difference between this second schedule and the 20C Schedule that was developed prior to the strike, particularly in the case of ships nearing completion, such as SSN 690 and SSN 692.

G. E. MacDonald

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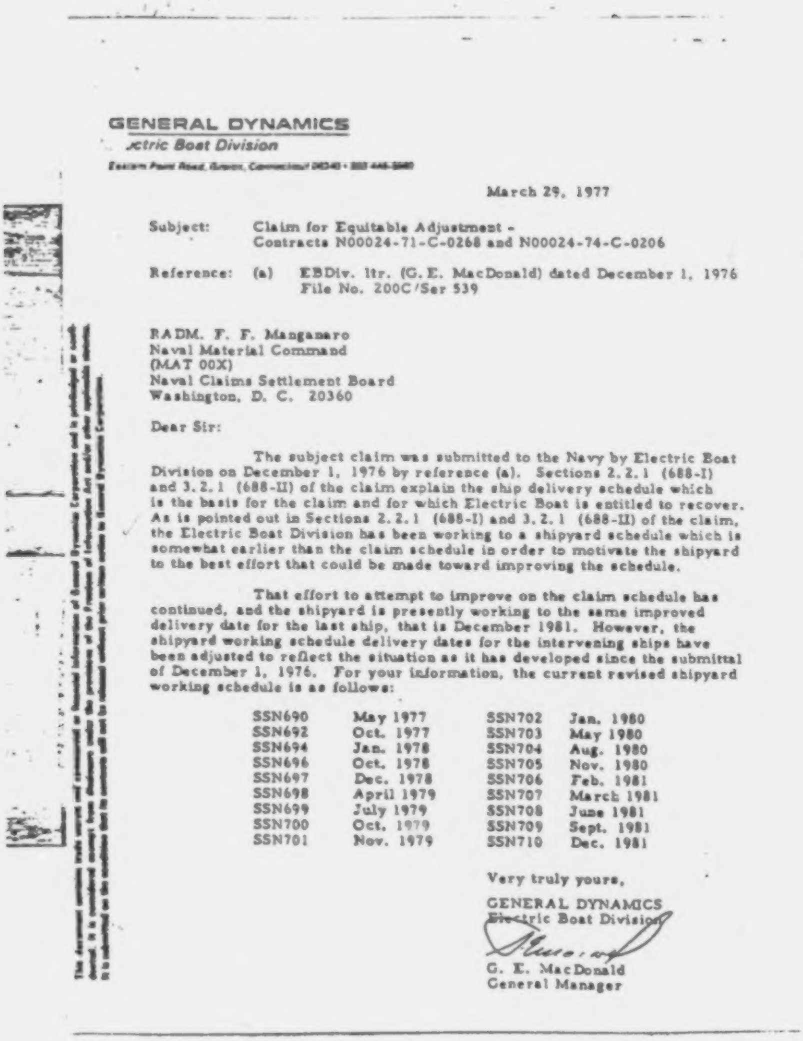

GENERAL DYNAMICS
ctric Boat Division
Eastern Point Road, Groton, Connecticut 06340 • [illegible]

March 29, 1977

Subject: Claim for Equitable Adjustment -
Contracts N00024-71-C-0268 and N00024-74-C-0206

Reference: (a) EBDiv. ltr. (G.E. MacDonald) dated December 1, 1976
File No. 200C/Ser 539

RADM. F. F. Manganaro
Naval Material Command
(MAT 00X)
Naval Claims Settlement Board
Washington, D. C. 20360

Dear Sir:

The subject claim was submitted to the Navy by Electric Boat Division on December 1, 1976 by reference (a). Sections 2.2.1 (688-I) and 3.2.1 (688-II) of the claim explain the ship delivery schedule which is the basis for the claim and for which Electric Boat is entitled to recover. As is pointed out in Sections 2.2.1 (688-I) and 3.2.1 (688-II) of the claim, the Electric Boat Division has been working to a shipyard schedule which is somewhat earlier than the claim schedule in order to motivate the shipyard to the best effort that could be made toward improving the schedule.

That effort to attempt to improve on the claim schedule has continued, and the shipyard is presently working to the same improved delivery date for the last ship, that is December 1981. However, the shipyard working schedule delivery dates for the intervening ships have been adjusted to reflect the situation as it has developed since the submittal of December 1, 1976. For your information, the current revised shipyard working schedule is as follows:

SSN690	May 1977	SSN702	Jan. 1980
SSN692	Oct. 1977	SSN703	May 1980
SSN694	Jan. 1978	SSN704	Aug. 1980
SSN696	Oct. 1978	SSN705	Nov. 1980
SSN697	Dec. 1978	SSN706	Feb. 1981
SSN698	April 1979	SSN707	March 1981
SSN699	July 1979	SSN708	June 1981
SSN700	Oct. 1979	SSN709	Sept. 1981
SSN701	Nov. 1979	SSN710	Dec. 1981

Very truly yours,
GENERAL DYNAMICS
Electric Boat Division

G. E. MacDonald
General Manager

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GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO P. T. Veliotis

FROM N. D. Victor

FILE NO

SUBJECT SSN688 Class Schedules

REFERENCE

Date November 28, 1977

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Enclosure: (1) SSN688 Class Baseline Study, Dated 10/31/77

The purpose of this memo is to provide you with the basic facts used to develop the proposed SSN688 Class Master Program Plan depicted in Enclosure (1).

I believe that this plan, if implemented will make optimum utilization of available resources. The schedules were conciously developed to provide conditions permitting the correct number of people to work on the correct jobs in the proper sequence and the same crews performing the same tasks from ship to ship. The work can be fully supported by existing facilities, tools and material. We believe that under this plan the SSN688 Class submarines can be produced on schedule at the lowest expenditure of labor hours.

The following ground rules were applied in developing the plan:

- The SSN699 is the only ship constructed and launched from the Land Level Construction Facility (LLSCF).

- The Division's material problems will be resolved by January, 1978.
- A minimum ways time of 19½ months and a minimum launch to delivery interval of 15 months were developed to eliminate overcrowding of the ships or overloading of facilities.
- The plan recognizes a minimum of 2½ months delay to launch and delivery on SSN697 ship currently in pre-launch condition. (i.e., undock.)
- A minimum 17-week interval between launches is maintained starting with SSN697.
- The plan must permit work crew roll-over with repetitive job assignment at the worker level, covering both shop and shipboard work to the maximum extent possible.
- Sufficient manpower will be allocated to accomplish all planned and workable work to schedule.
- Shipyard trades manning will not exceed current levels and will be kept constant as long as possible to allow for maturing of skill levels and learning to take place.
- The plan can be accommodated by the Division's present manufacturing, shipbuilding, and test facilities.

Based upon the above ground rules we proceeded to develop the plan as follows:

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The planned undocking of the SSN697 was rescheduled 2½ months later from January 14, 1978 to April 1, 1978 to permit an equivalent launch at 80% completion. The launches of the remaining ships were then established 17 weeks apart with two exceptions.

The intervals between SSN703 and 704 and SSN707 and 708 had to be expanded to 34 weeks to suit building ways availability.

Work experience on earlier SSN688 Class ships as well as comparable jobs in earlier contracts was then used to develop a single ship "model" schedule. This schedule provides for an 80% complete launch with a minimum achievable on ways time of 19½ months. Similarly it was determined that the minimum achievable launch to delivery interval was 15 months.

The SSN703 was chosen; therefore, as the first model ship and all following ships through the SSN710 have identical "model" schedules.

The following key feature will result from the implementation of the proposed plan:

- The schedule provides a means for implementing a crew roll-over plan with roll-over assignments for all jobs -- manufacturing, installation and test. In order to overcome current unskilled labor and green supervision problems roll-over must be planned below the foreman to the level of the individual worker.

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- The irregular launch intervals between SSN703 and 704 and SSN707 and 708 will require special shipyard management attention for compatability with the roll-over plan.
- Cost savings will result from the decision to build all ships (except SSN699) on the building ways.
- As part of the study it was determined that earlier ships were over progressed. For example SSN696 launched on a reported 76.5% progress, the real progress was determined to be 71.3% for that ship at that time. The proposed schedules adjust for this over progressing by holding the ships on the ways long enough to permit an acceptable percent completion at launch.
- Manning requirements will not exceed current onboard levels, which will permit maturing of skill mix and learning.
- Realistic on ways and post launch intervals will permit real schedule discipline.
- Delays in solving the Division's material problems beyond January, 1978 will result in additional delay beyond these schedules.
- Realistic span times and building all ships on the ways after SSN699 result in a delay in delivery of the last ship (SSN710) from 8/28/82 to 5/19/84.

As an alternative to my above plan, the SSN688 Class Program Office has recommended a schedule providing equal intervals between launches.

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This requires increasing the launch intervals from 17 to 20 weeks which results in a reduction in on ways times from 19½ months to 18½ months. The resulting delivery date of the last ship, SSN710 however, is held to May 19, 1984, (the same end date as in Planning proposed schedule).

I recommend that the final determination be made by the Trades as to which schedule alternative is more advantageous, equal launch intervals or longer ways time.

Director of Planning

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DEC - 7 1977

OFFICE OF
T. B. CRAMER

GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: P. T. Veliotis

FROM: N. D. Victor

FILE NO.:

SUBJECT: SSN688 Class Schedules

REFERENCE:

Date: December 5, 1977

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ENCLOSURE: (1) SSN688 Class Baseline Study, dated October 31, 1977

The current SSN688 Class Master Program Schedule, Rev. 05 dated June 29, 1977, for SSN692 through SSN710 cannot be achieved. Since issue of this schedule, the Division has been experiencing an average 1 week of schedule delinquency for each 4 weeks worked. By year-end we can expect to be on average, 1½ to 2 months behind schedule.

As a direct result of unforeseen scope growth and material problems resulting from late Government-furnished design data and Government-responsible design changes; this Division, since initial contract award, has been unable to adhere to any issued 688 Class Master Construction Schedule. Unrealistic recovery schedules probably adapted to accommodate Customer Procurement Positions with the Congress, caused intermittent crash hiring programs resulting in further inefficiencies from inadequate skill mix.

With Government-responsible design changes significantly abated, now is the time to solve these problems once and for all. As a first step, Planning recommends establishing "achievable" schedules based on actual experience to date and incorporating reasonable schedule duration improvements through the later ships.

Enclosure (1) sets forth for the first time on the 688 program, "achievable" schedules for each of the 17 remaining ships, formulated on the following basis:

- Two of the three ships currently planned for construction on the LLSCF (i.e., SSN704 and SSN709) are reassigned to building ways. This will result in lower construction costs for each of these ships and enable shipyard management to obtain greater control of material, people and facilities utilization.
- Actual achieved time spans on SSN690/SSN692 from Reactor Compartment Erection to Delivery were used for current ship construction schedules with a gradual reduction in time spans and manhours incorporated on later ships in the program.

- Shipyard trades manning remains constant at current levels for as long as possible to allow for maturing of skills and learning.

- Intervals between ship launches lengthened to obtain a minimum duration of 17 weeks to finally permit work crew "roll-over" for both shop and shipboard work.

- Adequate pre-ways and on-ways intervals provided to accommodate completion of 75% of ship construction prior to Launch without overcrowding work stations.

- Current material situation brought under control with remaining unresolved material problems identified and remedial action undertaken during January 1978.

The proposed schedules for SSN704, Electric Boat's 12th ship was compared with the schedule for SSN717, Newport News' 12th ship. The time span from Start of Construction to Delivery for both Newport News (52 months) and Electric Boat proposed schedules (53.5 months) are essentially the same.

Tom Cramer, SSN688 Program Manager, is in agreement with the proposed schedules.

This may be our final opportunity to regain the Division's credibility to compete for new business. Survival of Electric Boat as a business entity could well be at stake.

N. D. Victor

NDV:jg

cc: T. S. Cramer
G. S. Grimes

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Boat tax per / Bud

(34)

TO ST. LOUIS OFFICE FROM HARTFORD OFFICE

T. L. LENGFELDER T. R. LAMAGE

JANUARY 23, 1976

GENERAL DYNAMICS - ELECTRIC BOAT DIVISION

As you requested, we have reviewed the computation of the provision for Federal income tax of the above captioned division as reflected on tax schedule 1 (previously sent to you). It should be noted that the audit work in the tax area was not fully completed at the time of our review and certain of the schedule M items had not been traced to the audit workpapers. During the course of our review, the following points came to our attention.

Client Tax Schedules

While the preparation of the tax schedules by company personnel has improved somewhat this year, the schedules still do not reflect certain schedule M's such as CPFF cost disallowance, schedule M and SSN-688 contract schedule M. We understand that these schedule M's are completed at Corporate.

Investment Tax Credit

As discussed in the preliminary tax memorandum, EB personnel have been working closely with St. Louis corporate personnel in developing a very aggressive investment tax credit approach with respect to the LLEC facilities. EB personnel are very familiar with ITC rules and recognize that certain positions they have taken could be challenged on examination. For this reason, it would appear appropriate to break down the total investment credit taken between solid credit and credit which could be lost on examination. Bill Mulcahey indicated that by the end of 1976, approximately 11 million of credit will have been claimed on the LLEC facility and 2 million of that would represent aggressive positions.

In 1975, the client's tax schedules reflect investment credit earned this year of $3,800,000 plus an additional $222,000 on special tools. The major portion of the qualifying additions for which the credit was earned relates to the inboard portion of the LLEC. As discussed in the preliminary tax memorandum, the following positions are being taken with respect to the LLEC which you should be aware of.

1. LLEC is going to be considered "acquired" and 10% credit will be taken for the portion placed in service in 1975.

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2. Aggressive positions are being taken with respect to when property was placed in service in 1975. In addition, the client is claiming the credit on disputed amounts where it is uncertain just what the final liability to the contractors will be (unnegotiated change orders).

3. Aggressive positions are being taken in classifying additions between machinery and equipment, and non-qualifying buildings.

4. Sales tax is being deducted with respect to the entire project which is in direct contradiction to the acquired property position.

It is difficult to estimate how much of the 1975 ITC could be lost on examination without a complete analysis of the 1975 costs. Such an analysis could be considered in 1976 since the entire facility would be complete and the ITC exposure could be estimated on an overall basis.

Avenel

Avenel division is reported as part of Electric Boat. Althoug only limited audit work was performed in connection with Avenel, the following points were noted from our review:

1. A loss reserve of approximately $3,000,000 set up in 1973 is reversing this year. The reserve was not fully utilized and approximately $500,000 is being reversed to income. If the reserve was not deducted for tax purposes in 1973, a deduction of approximately $2.5 million should be availble this year.

2. The reserve for warranty costs increased by $150,000 this year to $300,000. Such increase may not be currently deductible for tax purposes.

3. An additional reserve for $100,000 on LNG Tankers was recorded this year. Such reserve may not be currently deductible for tax purposes.

Reserve for Cost Disallowances

The reserve for unconceded cost disallowances have increased during 1975 from $5,067,996 to $8,000,619, an increase of $2,932,023. The increase in this reserve has not been tax effected on Schedule M since this is only part of the schedule M with respect to cost disallowances. The other part of this schedule M is a reduction in book

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income representing the actual disallowances during 1975, and the conceded costs in excess overhead. The client's tax schedule reflects a write-off of approximately $263,000 in computing the reserve but no computation of actual disallowances or conceded costs in excess overhead has been made and, accordingly, we cannot compute the 1975 schedule M item.

688 Schedule M

The projected loss on the 688 program has been increased to $130 million. This is based on a $160 million loss projected on the first flyte and a $30 million profit projected on the second flyte. For financial reporting purposes, no loss is being recorded since a Request for Equitable Adjustment (REA) has been filed with the government and it appears certain that the adjustment will be at least equal to the currently anticipated loss.

For tax purposes, as we suggested in last year's memorandum, the two flytes were treated separately and a deduction was claimed for the amount of loss incurred to date on the percentage of completion basis. The client's computation of this deduction as set forth on the schedule sent to Hartford by John Reed with his memorandum dated January 7, 1976, which the Hartford office did not review prior to filing, was $95 million for 1974. It appears from that schedule that such a computation was based on an anticipated loss in excess of $750 million. Projections of the current year schedule M by the client on the same schedule, indicate an additional deduction of approximately $65 million based on an overall loss of $640 million.

Our computation of the schedule M for 1975 is as follows:

Contract	Income or (Loss) Projected (Millions)	% Complete	Income (Loss) Recognized
688 - I	(160)	59	(94.4)
688 - II	30	9	2.7

	Total loss to date		(91.7)
	Loss deducted in 1974		95.0

	Income to be recorded in 1975		3.3
			====

We are unaware of the source of the client's projections which resulted in the $65 million deduction, but, based upon our audit work,

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it appears excessive. In addition, upon approval of the REA, income will have to be recognized for tax purposes in the amount of the adjustment times the percentage of completion. Such recognition, which will most likely occur in 1976, will result in the reversal of a substantial portion of the timing difference created by these deductions.

Self-insured Medical and Workman's Compensation Plans

Balance sheet reserves for medical insurance and workman's compensation insurance can be summarized as follows:

	1974	1975	Increase
Medical Insurance	$1,245,514	$1,728,322	$482,808
Workman's Compensation	$ 425,589	$1,212,339	$786,750

In accordance with instructions from corporate, the increase in these reserves has not been treated as a Schedule M item since the corporate policy is to currently deduct these items.

Strike Costs

The strike costs incurred in connection with the Metal Trades Council strike this year of $12,289,577 are being deducted currently for tax purposes. For financial reporting purposes, these costs are being amortized over the life of the labor agreement signed. Accordingly, a schedule M item for current strike costs of $11,997,756, representing the unamortized portion of the costs, will be deducted this year. Additionally, the amortization for financial statement purposes of previously deducted costs from prior strikes in the amount of $667,236 is a schedule M item this year.

Eastern Data Systems Center

Hartford has no audit responsibility with respect to Eastern Data Systems Center as this division is separately reporting to General Dynamics. It should be noted that we did not review the investment credit being reported by the Eastern Data Systems Center.

Quonset Point Deferred Start-up

In connection with beginning operations at Quonset Point, $4,612,172 of costs are capitalized on the balance sheet at December 31, 1975. These costs represent the unamortized portion of the deferred start up expenses. We understand that the client considers these costs in the nature of overhead and therefore proper inventory items,

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which they are amortising over the period 1975 - 1977. We [illegible] in the 1974 points that consideration be given to deducting these costs; however, the company decided to follow book treatment of this item.

Costs relating to transportation and installation of government furnished equipment at Quonset Point amounting to $1,425,871 are being deducted on Schedule M for tax purposes this year. These costs are included in fixed assets for financial reporting. A similar deduction was taken last year of $438,148.

T. E. LANAGER

cc: Mr. John Reed, St. Louis

sb

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GENERAL DYNAMICS CORPORATION

MEMORANDUM ON USE OF REVISED YEAR-END BUDGETS AT ELECTRIC BOAT DIVISION FOR 1974

FACTS

Electric Boat Division is on a percentage of completion accounting method for Federal income tax purposes. With respect to each fixed price type construction contract, revenue is based on the ratio of incurred costs to total estimated costs at year-end times the gross contract price. Estimated costs to complete a contract are based on various financial and estimating data and are incorporated in the Division's budgets which are prepared by Comptroller personnel.

The 688 Class Submarine program was started in 1970. The basic designs for the subs were to be prepared by Newport News and furnished to Electric Boat Division by the Navy. Because of the complexities involved, there have been enumerable design changes which were the principal causes of delays and increased costs of construction beyond the original estimates. As early as 1971, EB became aware that there were problems. Delays and cost overruns posed a serious threat to the profitability of the contracts, but how serious the delays and cost overruns were and whether or not they could be overcome was uncertain. By 1973 and 1974, enough information was available to start quantifying the additional costs.

In determining the 1974 year-end budget, there were significant differences of opinion with respect to the cost at completion. These differences were on the order of several hundred million dollars.

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For book purposes, management considered all the facts and decided to adopt a middle point of view by accuring no profit on the program. This view anticipated improvement in the shipyard which would offset some of the cost overruns and claims against the Navy for the extra costs caused by the design problems.

A study completed by Electric Boat Division personnel in August 1974 showed an estimated $84 million loss on the first contract for seven subs and an estimated $35 million loss on the second contract for eleven subs before taking into account any claims for additional revenue. In November 1974, a series of analytical studies of the program were prepared for top executives in St. Louis in connection with the performance on the program and a proposed bid on the third contract in the program. The analyses dealt with estimates of labor costs made by those performing the work and those prepared by the professional estimators. This study, which took about two months to complete, was based on cost data at the end of November 1974. At the same time there was sufficient factual data available to demonstrate a substantial liability on the part of the Navy for deficient drawings, etc., and the preparation of a claim was commenced.

At the end of 1974, EB submitted a claim to the Navy in the amount of $220,000,000.

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In early 1975, performance on the program had not improved and consequently the differences of opinion which previously existed were considerably less. The June 1975 budget reflected these more realistic cost estimates.

The total estimated contract costs reflected in the 1974 tax return was based on the June 1975 budget which was essentially a corrected version of the position management took in December 1974.

DISCUSSION

The data supplied and the discussion of such data during interviews with Internal Revenue Agents demonstrates beyond any reasonable doubt that the June 1975 budget clearly reflected the estimated costs of the program at year-end 1974. The December 1974 budget used by shipyard personnel who thought the problems could be solved and any overruns recovered through improved performance proved to be overly optimistic which is why they were not adopted by management for financial purposes at the end of 1974.

Subsequent events since 1974 make it evident that even the revised 1974 budget estimates were understated. The potential losses on these contracts are in the hundreds of millions of dollars. Claims to date against the Navy exceed $500 million.

In conclusion, it is clear that costs incurred through 1974 had far exceeded original estimates. Data was available in 1974 to support the cost estimates used in the 1974 tax return. There was no sudden catastrophe. Instead the problem had surfaced early in the program and it was merely a matter of accumulating sufficient factual information to determine the seriousness of the problem. There was always the remote possibility that the overruns could be minimized through improved performance, but by the end of 1974 it was clear that such improvement was impossible. The factual information assembled in November and December 1974, in conjunction with the preparation of the claim against the Navy for an equitable adjustment and the bid on the third contract, more accurately and fairly represent the true contract costs.

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GENERAL DYNAMICS

Sub 688 I

WRITTEN WIRE MESSAGE

TO	INDIVIDUAL A. H. BARTON	LOCATION ELECTRIC BOAT - GROTON, CT.	DATE 4/29/77 NO. OF PAGES 4
FROM	NAME J. P. ROSS JPR	LOCATION CORPORATE OFFICE - ST. LOUIS	OPERATORS USE ONLY MSG. NO.

TYPE ALL CAPS SINGLE SPACE

RE: 688 PROGRAM

THE ATTACHED MEMORANDUM IS TO BE FURNISHED TO THE I.R.S. WE WOULD APPRECIATE YOUR REVIEW AND COMMENTS.

Gil Retype

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GENERAL DYNAMICS CORPORATION

MEMORANDUM ON USE OF REVISED YEAR-END BUDGETS
AT ELECTRIC BOAT DIVISION
FOR 1974

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FACTS

Electric Boat Division is on a percentage of completion accounting method for Federal income tax purposes. Revenue is based on the ratio of incurred costs to total estimated costs at year-end with respect to the contract times the gross contract price. Estimated costs to complete a contract are based on numerous financial data and ~~shipyard~~ estimates, and are incorporated in the Division's budgets which are prepared by the ~~financial department under~~ Comptroller personnel, ~~Arthur M. Barton, Comptroller~~.

The 688 Class Submarine program was started in 1970. The basic designs for the subs were ~~to be~~ to be prepared by Newport News and furnished by the Navy to Electric Boat Div ~~through~~ a ~~subcontract by~~ with ~~Newport News Shipbuilding~~. Because of complexities involved, ~~it has made~~ there have been enumerable design changes, which ~~have~~ delayed ~~construction~~ completion of the ships (were the principal causes of) and increased costs of construction far beyond the original estimates. As early as 1971, ~~it knew there was a serious~~ it became aware that there were problems. ~~The~~ Delays and cost overruns posed a serious threat to the profitability of the contracts, but how serious the delays and cost overruns were and ~~how it might be cured was uncertain~~ whether and how they could be overcome was uncertain. By 1973 and 1974, ~~it had~~ enough information was available to start quantifying the additional costs.

In determining the 1974 year-end budget, there ~~was a serious~~ were significant differences of opinion ~~between the shipyard personnel, who were still optimistic that~~ with respect to the est. of completion. [illegible] ~~[illegible]~~ [illegible] ~~the problems could be solved, and the financial people who were expressing a less pessimistic view based on cost and performance data available~~.

These differences were ~~on the~~ on the order of several hundred million dollars

For book purposes, management considered ~~both positions~~ ~~the situation~~ all the facts and decided to adopt a middle point of view of accruing no profit on the program. This view anticipated improvement in the shipyard which would offset some of the cost overruns, ~~if any~~, and claims against the Navy for the extra costs caused by the design problems.

~~According to Mr. Barton,~~ A study completed by Electric Boat Div. personnel ~~in~~ August 1974 showed an estimated $84 million loss on the first contract for seven subs and an estimated $35 million loss on the second contract for eleven subs before taking into account any claims for additional rev[illegible]. In November 1974, ~~Mr. Barton's group started preparing three~~ a series of analytical studies of the program ~~for~~ were prepared for top executives in St. Louis in connection with a proposed bid on the third contract in the program. The ~~views represented~~ analyses dealt with [illegible] estimates of material and labor costs supplied by ~~the shipyard and estimates supplied by the financial department~~ those performing the work and the professional estimators. This study, which took about two months to complete, was based on cost data at the end of November 1974. At the same time ~~it was~~ there was sufficient data available to demonstrate a substantial liability on the ~~preparing a claim against~~ the Navy for deficient drawings, etc. and the preparation [illegible] ~~In December~~ 1974, EB submitted a claim to the Navy ~~which showed costs far in excess of the current budget since it was obvious that the view of the operating personnel was quite optimistic.~~ in the amount of $220,000,000

In early 1975, ~~the shipyard was asked to provide more realistic budgets to be used for the bid on the third contract. Though still somewhat optimistic, the revised shipyard budgets were closer to the financial estimates based on data accumulated on the work performed to date.~~ performance on the ~~contract~~ program had not improved and consequently the differences of opinion on the cost that existed earlier were considerably less. The June 1975 budget reflected these more realistic cost~~s~~ estimates.

The total estimated contract costs reflected in the 1974 tax return was based on the June 1975 budget which was essentially a corrected version of ~~the December 1974 budget.~~ the position [illegible] December 1974

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DISCUSSION

The data supplied and the discussion of such data during ~~comments made by Arthur Veron in his~~ interviews with ~~the~~ Internal Revenue Agents demonstrate ~~indicates~~ beyond any reasonable doubt that the June 1975 budget clearly reflected the estimated costs of the programs at year-end 1974. The December 1974 budgets used the ~~[illegible]~~ ~~was clearly an overly optimistic approach~~ by the shipyard personnels who thought the problems could be solved and any overruns recovered through improved performance. ~~[illegible]~~ proved to be overly optimistic which is why they were not adopted by management for financial [illegible]

Subsequent events since 1974 make it evident that even the revised 1974 budget estimates were understated. The potential losses ~~suffered~~ on these contracts are in the hundreds of millions of dollars. Claims to date against the Navy exceed $500 million~~; without considering the costs due to deficient performance that GD has incurred~~.

In conclusion, it is clear that costs incurred through 1974 had far exceeded original estimates. Data was available in 1974 to support the cost estimates used in the 1974 tax return. There was no sudden catastrophe. Instead the problem had surfaced early in the program and it was merely a matter ~~of determining~~ documenting sufficient factual information to determine the seriousness of the problem. ~~The shipyard personnel kept assuring that~~ There was always the remote possibility that the overruns could be ~~recovered~~ [illegible] through improved performance, but by the end of 1974 it was clear that such improvement was impossible. The ~~data~~ factual information assembled ~~put together~~ in November and December 1974, in conjunction with the preparation ~~for purposes of the Navy claim~~ of the claim and [illegible] and the bid on the third contract, more accurately and fairly represent the true contract costs.

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2.6 Current Status of 688 Class Submarine Program

The Committee discussed at length the current status of the 688 Class submarine program. The Navy has indicated that it will be prepared shortly after 1 July 1975 to discuss the Request for Equitable Adjustment (REA) on the first flight. Negotiations on the REA are expected to require six weeks or longer to complete.

A further report on the 688 program is contained in Item No. 12 of these minutes.

6. Electric Boat Division - Quonset Point Facilities - Approval of Guarantee of Rhode Island Revenue Notes

Mr. MacDonald reported that the arrangements had been substantially completed for the issuance and sale by Quonset Point Facility Corporation of up to $15,750,000 of Notes to finance improvements to the Quonset Point facilities being leased to the Electric Boat Division.

Mr. MacDonald stated that, as previously reported to the Board, the arrangements contemplated that the Corporation would guarantee repayment of the Notes. In the discussion which followed, Mr. MacDonald answered various questions by the Directors with respect to the arrangements. He reiterated that the repayment of the Notes will be supported by the rental payments for the facilities leased to the Corporation at Quonset Point and that the rental payments are guaranteed under the Corporation's facilities agreement with the U. S. Navy.

After discussion, on motion duly made, seconded and unanimously carried, it was

No. 75-38 RESOLVED, that the Chairman, the President, the Executive Vice President - Finance, or the Vice President and Treasurer of the Corporation be, and each of them hereby is, authorized in the name and on behalf of the Corporation and under its corporate seal (attested by the Secretary or an Assistant Secretary of the Corporation if affixed) to execute and deliver, and to delegate to other officers of the Corporation the authority to execute and deliver: (1) an instrument of guarantee (the "Guarantee") in favor of Industrial National Bank of Rhode Island, Trustee for the holders of Notes (the "Notes"), not to exceed $15,750,000 in the aggregate, to be issued and sold by the Quonset Point Facilities Corporation through underwriters in a private placement, under which the Corporation will unconditionally guarantee the repayment of the Notes, and (2) any other instruments that may be necessary or advisable to effectuate the Guarantee; that the Guarantee and other instruments (if any) shall be in such form and contain such terms and provisions as the officer executing the same and counsel for the Corporation shall determine necessary or advisable and approve; and that the execution of the Guarantee and any other instrument or instruments by one of the officers of the Corporation designated above or by any other officer of the Corporation pursuant to a duly executed delegation shall be conclusive evidence of the validity of the execution of the Guarantee and any other instruments and the binding nature of the Corporation's obligations as set forth in the Guarantee and any other instruments.

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12. Report on Status of 688 Class Submarine Program

Mr. Lewis reviewed a chart showing projected costs overruns on the first and second flights of the 688 program as reported in the Request for Equitable Adjustment compared to forecasts by the Operations Department of Electric Boat, and ordered a copy of the chart filed with the records of the meeting.

An extended discussion ensued regarding the reasons for the overruns, the validity of the cost projections, and additional steps which might be taken by the Corporation in its continuing effort to improve productivity at Electric Boat.

Mr. MacDonald reported on the management situation at Electric Boat and other organizational matters.

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Mr. Jenner commented on the significance of the REA negotiations and emphasized the advisability of designating an executive at the Corporate Office with full time responsibility for the marine divisions.

Mr. Lewis stated that Electric Boat's bid on the five 688 ships comprising the third flight of the program provided for reseting the price after several ships on the first flight have been delivered. The Navy has stated that it will not accept a reset bid and he requested a new fixed price proposal. Mr. Lewis stated that he plans to visit with Admiral Rickover on Friday, 20 June 1975, and with Admiral Gooding on Sunday, 22 June 1975, in an effort to persuade the Navy to accept a reset bid, but doubts that his efforts will succeed. In that event, in order to protect the Corporation's position on the REA, the Corporation may be forced to submit a bid as requested by the Navy.

After further discussion, it was agreed that, if required, Electric Boat should submit a bid at an appropriate price rather than risk jeopardizing the REA.

The management situation at the Electric Boat and Quincy Divisions was discussed at length. Several Directors supported Mr. Jenner's suggestion that an executive be designated at the Corporate Office to assume direct responsibility under Mr. Lewis for the overall management of both Divisions. Mr. Lewis said that this step had been considered and that he had had discussions with Mr. MacDonald regarding the possibility of Mr. MacDonald's taking the assignment. Mr. Lewis stated that he planned to discuss the matter further with Mr. MacDonald, after which a decision would be made.

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September 8, 1975

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Aerospace Files

GENERAL DYNAMICS CORPORATION

This morning, Gorden MacDonald, EVP-Marine, visited with HEC through lunch. Gorden was in town to meet with the accountants who were here in the city on their annual meeting. We had a long discussion of the company and its position and a thorough review of many of the figures. Gorden had a substantial amount of data with him which he had presented to the Board of Directors as well as a bunch of photos which we looked at during the course of the session on a viewgraph machine. He gave us the basic presentation that he had made at the Board of Directors Meeting about a week ago.

Gorden indicated that the June Board Meeting of the company was an extremely hot meeting and there was a great deal of tension and the whole meeting took Many many hours. The problem was that there had been released to the Board an indication that the situation at the Electric Boat Division was much worse than they had originally anticipated. We had originally been told that there might be a loss there on the first flight of roughly $100MM with a profit on the second flight of $50MM or a net loss of $50MM which was to be more than covered by a request for an equitable adjustment of up to $200MM. The new figures that were shown to the Board at the June session indicated that there was a loss of roughly $200MM on the first flight and $60MM on the second flight or a total loss of $260MM before any request for equitable adjustment. The request for equitable adjustment they estimated to be somewhere in the area of $120MM on the first flight and $40MM on the second or a total of $160MM which would leave a net loss of approximately $100MM. Needless to say, this shook up Colonel Crown and other members of the Board of Directors and there was much recrimination and discussion. As a result of the meeting, Gorden was asked by the Board to go and devote 99% of his time to running Quincy and Electric Boat and was told that he was to report directly to the Board of Directors on these two divisions. Gorden therefore has been spending all of his time in the Quincy/Groton area and has not been home for the last 7 weeks. He indicated that once he began to dig into the situation in depth, he discovered that the company had too many planners on the job at Electric Boat and that the result was no coordination between the various groups of planners and the management of the yard. A result of this situation was that there was no tie between the material acquisition program and the hiring of people, in other words people were being hired before materials were available and contrariwise materials were available long before the necessary people had been hired and trained. Needless to say, this was driving up hours, overtime and cost and investment in inventories. As a result of this mismanagement the Board was very anxious to fire both Joe Pierce and Mel Curtis, the two individuals

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running the Electric Boat Division. However, the management of GD was able to convince the Board that this was not the thing for the company to do. As a result, the plan now is that Joe Pierce will be asked to retire since he is over 60 years of age and has over 25 years of service so that he can retire on a full pension without any penalty. As to Mel Curtis he will presumably stay on since he gets along well with Admiral Rickover which is a key aspect to the job. However, there well may be somebody new going in as the manager in due course since Mel is not the kind of executive who is a full time man but merely an excellent trouble shooter who can go into a situation and get it straightened out but is not the permanent man to run a division.

Gorden said that the strike which still is going on at Electric Boat has been a blessing in disguise for the company since it has given them the chance to regroup their forces and to take the necessary time and steps to consolidate their picture. They now have established a really efficient program and know where they are going to go. They have taken a 100% physical inventory of everything in the yard. They have had a chance to make a substantial amount of progress on the construction programs for the capital expenditures necessary which had been a matter that interfered with the smooth operation of the production. Also, they have developed a really good start up plan in full detail and this uses the full facilities that the company has at Groton and Quonset Point including the four ways that they have plus a new building that is available for the assembly of both the 688 and the Trident submarines. In addition, the company has been able to make great progress in all of its tools that they have acquired including the automatic welding equipment which for some time was not being fully utilized. The company does feel at this time that the strike will break up by October 1st. The company apparently is now willing to compromise on the work rules if it has to and they feel that this will result in the people going back to work. As a result, all of the steps being taken and a really thorough reassessment of the whole situation, Gorden now feels that the company can breakeven on the total program of flights 1 and 2 assuming that they are able to get approximately $160MM on the request for an equitable adjustment. With respect to this, Gorden feels that it is not an unreasonable assumption since the Navy has already offered on flight 1 $70MM as an initial start. Gorden also feels that they will be able to get some progress payments on the claims as they go along and the negotiations make more progress. As a result, he feels that this will mitigate the cash problem that could otherwise occur. He has asked Arthur Andersen & Co., the company's auditors, to go up to Electric Boat and also to Quincy to review these two operations immediately in anticipation of the final audit and also so that there will be no problem or question when the need to release the 3rd quarter net profit figure is reached which comes around the middle of November. This August the company had quite a problem since they had postponed their regular Directors Meetings and then found that they had to release the figures (earnings) to the SEC by August 15 or request a deferment. They were very reluctant

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to ask for the deferment since they would have to give some explanations and they did not want to get into a great deal of detail with the SEC on any of the problems. Also, they felt that they could not use the excuse of a delay in the Board Meeting as a reason. Gorden also assured us that the company still has huge hidden reserves on its books or that it can take which arise from a number of the other company programs including the F-111 program. Gorden did have with him substantial amount of documentation on both the Electric Boat and the Quincy Division figures and these are going to be sent to the banks in the very near future.

With respect to the Quincy Division, the situation there is looking better than ever before. However, he feels that there is still some time before he will be able to give a full assurance to the Board of Directors including Colonel Crown that everything is perfectly okay. However, he had a number of pictures of the progress being made including pictures of the new crane and of ships Nos. 1, 2 and 3. In addition, ships Nos. 4 and 5 have been started as far as cutting metal is concerned. The pictures would indicate that ship #1 is almost completely ready and #2 is very far along and #3 has the keel laid and the beginnings of the ships are evident in the picture. He indicates that based on their estimates to date, ship #1 will cost a fair amount more than they had originally budgeted but that as they come down the learning curve the laded ships will cost less than had been estimated so that they will come out with a profit still on the total program. In addition, they have been getting very positive news with respect to additional orders. There has been a number of meetings between the company and the Burmah Tanker people including a meeting that is to take place tomorrow up at Quincy. At this meeting, Gorden and Dave Lewis will be there to meet with key members of the Burmah group including Downing who is the new head of the company. The situation would appear to indicate that the Cherokee companies which are the companies that are financing the five ships for the Indonesias run are being revitalized. Mr. Kulukundis who had formerly been the head of Burmah Tankers has been hired back again as a consultant and this in Gorden's opinion is a positive step since he feels Kulukundis is able to get things done. Also, the Indonesians are beginning to press Burmah for additional orders for the two ships that are part of the original contract and also are pressing for five more orders. In addition, Marhad has gotten into the act since one of the reasons that Marhad was willing to give title #11 financing commitments to Cherokee was that there was an implied promise that there would be at least 9 ships ordered. The facility at Charleston where the SPHERES are being constructed is going along well and Gorden also had a number of pictures of the site and progress being made down there. The tooling is going up rapidly and the equipment that was constructed by the Swiss firm of Vevey are being put together in very speedy time and are doing extremely well. Gorden feels that the situation there is now very optimistic and they are cutting metal and really doing a great deal with respect to the first spheres. The plan now is that they will use for the first ship spheres which are built entirely from scratch and that will then go back and retool other

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spheres that had been partially built by the Pittsburgh Moleen Co. Also company the barges which are necessary for the transport of the spheres from Charleston to Quincy are being released to a firm that builds the barges. Cost estimates indicate that they will be spending roughly $59MM for capital expenditures at Charleston but that as a result of the expenditures that they make they will be able to go and manufacture the spheres at a cost which will be the same if not a little lower than the Pittsburgh Moleen original bids. Obviously, they will need additional orders to be able to write off the full capital expenditures on the program but the basic cost of the spheres will be in the ball park that they had originally contemplated. Therefore, the program itself looks as though it will be a profitable one and if additional orders can be found it will be even more profitable.

The other areas of the company are all doing quite well. Stromberg-Carlson continues to be profitable but not as profitable as had been hoped. The Arcadia Co. which is the area that does the inter-connect business will lose approximately $1.8MM. As a result, this has put Gene Berry in a cloud and it is pretty clear, according to Gorden, that a replacement will be found. As a matter of fact, both Gorden and Dave have recently interviewed an individual for this. Obviously, this is a highly confidential point. Fort Worth Division is doing extremely well with the F-111 program still going well and the cost doing amazingly well despite the fact that the end of this program is in sight. Progress on the F-16 is going extremely well too and Gorden told me in great confidence that the Government of Iran plans to buy approximately 250 of the F-16s which will be announced very shortly. He tells me that the company has no problem with respect to foreign bribes or commissions. He said that they were actually approached a number of times on the recent F-16 deal by various individuals who said that they could get the order for GD if they would pay something on the side to various people. Apparently, Dave Lewis reported this to McLucas, the Secretary of the Air Force and this was a very big factor in giving GD an inside track on getting this important contract. Gorden says that the construction of the F-16 is very simple and that there is no real reason why they would have any fear of production difficulties. Also, they are using a tested engine and therefore feel that should not be a problem. Convair - San Diego has been advised by the McDonnell Douglas Company that there is an additional cutback on production of the DC-10 to two per month which will bring up a renegotiation on price since the company is now below the minimal number of aircraft per month be delivered under the contract. The Datagraphix Company is doing very well this year, finally, as a result of the big Navy contract that they have for the S3A program with Lockheed under a directed procurement plan. The cole mines are doing well and the Asbestos Company is still out on a strike but the miners at Theatford apparently are beginning to show signs that they are willing to talk. The Pomona Division is over its strike and is doing well and making money. With respect to Canadair, the sale of the company to the Canadian Government is still expected to go through though there was a request for a delay in the option date which was granted to the Canadian Government with some sort of promise form the Canadians that there would be a favorable tax treatment with respect to the General Dynamics. They have told the Canadian Government that they would be willing to make an investment of approximately $3MM in this new company being formed by the Government to handle aerospace in Canada and are hoping also to tie it into a sale of F-16s. However, Gorden tells me that there is really no incentive on their standpoint and that they are not doing as much or as active bidding as is McDonnell and some of the other companies.

Gorden tells me that a bank meeting and a tour of the Electric Boat and Quincy Divisions is planned for early October and that we should be hearing from Wayne Wells within the very short time. By that time Gorden feels that the Electric Boat's strike will be over and also that the Quincy yard will be in good shape. He tells me that the company expects that they will be able to get through January without any monies from the Canadair sale or from the request for an equitable adjustment or any other situation though it might be to pull down the balances slightly. With respect to the potentials of getting money from the Dutch Government he thinks that something still can be done on that but he is very dubious that they can get the $400MM-$500MM that Wayne Wells has been talking about. The Metropolitan Life Insurance Company deal for approximately $25MM of financing for Stromberg-Carlson Finance is looking good and should go through. Also, the Prudential Insurance Co. is apparently still willing to wait on a very substantial increas in the term loan that it now has available. Incidentally, Gorden said that Wayne is doing a reasonable decent job there but that the Board of Directors has definately decided that Wayne is not the person to be the chief financial officer of the company. Again, this is confidential matter.

In general, it would appear that the situation at General Dynamics is in reasonable good shape provided that they can get the Electric Boat situation in order and live up to what the expectations are. With respect to that situation, the company has done very extensive studies and planning which they had not done previously with the result that they do think that they will be able to perform in accordance with the figures now being discussed. Gorden said that he would be able to give us copies at some future date of the material he had with us and we should be asking him for that immediately.

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HE Colwell

H. E. Colwell III
Vice President

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GENERAL DYNAMICS
Electric Boat Division

MEMORANDUM

TO: Mr. A. M. Barton

Date July 3, 1975

FROM: T. S. Wadlow

FILE NO.:

SUBJECT: 688-I and II Costs

REFERENCE:

Enclosure:
(1) Summary
(2) Manhour Forecast
(3) Schedule Analysis
(4) Rate Calculation

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Cost Engineering has recently updated its projection of costs on the 688-I and 688-II contract. Revenues, exclusive of the REA, were also forecasted so that a net loss could be calculated. While a relatively gross basis was used for adjusting these rates, Cost Engineering feels that the projections are nonetheless accurate within normal estimating error. Included in this update are the results of the Cost Engineering/Industrial Engineering "scope" review. Also included are the results of a review of the functional area manhours which makes them consistent with the 688-III bid.

Two forecasts have been made. The first is the updated Cost Engineering estimate. The current performance on the ships indicates that this set of numbers is somewhat optimistic, though certainly still potentially achievable. The second set of numbers (labeled "b") is more consistent with the Industrial Engineering forecast and, while recognizing substantial improvements in the future, starts from cost levels based on current performance trends.

Attached are four enclosures. The first contains the summary and pricing, the second shows the manhours forecast, the third summarizes the schedule analysis, and the fourth shows the rate derivation.

T. S. Wadlow
T. S. Wadlow

TSW:pk

Enclosure (1)

688-I and II Analysis Summary

	688-I		688-II		688-I and 688-II	
	a	b	a	b	a	b
Shipyard Manhours (000)	36,489	38,889	45,891	48,891		
Other Manhours (000)	10,270	10,930	12,315	13,040		
Total Manhours (000)	46,759	49,819	58,206	61,931		
Spent Manhours (000)	15,998	15,998	322	322		
To Go Manhours (000)	30,797	33,821	57,884	61,609		
Rate on Spent Manhours	$10.79	$10.79	$13.45	$13.45		
Spent Labor Dollars (millions)	172	172	4	4		
Rate on To Go Manhours	$14.82	$15.56	$18.07	$21.14		
To Go Dollars (millions)	$ 456	$ 526	$1,046	$1,302		
Material CAC (millions)	$ 212	$ 217	$ 471	$ 493		
Total Cost (millions)	$ 840	$ 915	$1,521	$1,799		
Revenue: Current Forecast (millions)	$ 523	$ 523	$1,224	$1,224		
Additional Changes (millions)	$ 7	$ 7	$ 20	$ 20		
Total (millions)	$ 530	$ 530	$1,244	$1,244		
(Loss) ($millions)	$ (310)	$ (385)	$ (277)	$ (555)	$(587)	$(640)

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E01 and E02

	* Baseline Including Supervision	Scope	Farmout	Skill Mix	Disruption	Slab	Shipyard	Potential Growth	Potential Total Shipyard
1	5,558	(20)	(187)	300	700		6,351	400	6,751
2	4,943	(20)	(216)	550	500		5,757	300	6,057
3	4,767	(20)	(236)	550	400		5,461	300	5,761
4	4,646	(20)	(490)	500	300		4,936	300	5,236
5	4,554	(20)	(406)	350	200		4,678	300	4,978
6	4,481	(20)	(288)	250	100		4,523	300	4,823
7	4,420	(20)	(267)	250	-	400	4,783	500	5,283
	33,369	(140)	(2,090)	2,750	2,200	400	36,489	2,400	38,889
8	4,367	-	(250)	200	-	-	4,317	300	4,617
9	4,321	-	(250)	200	-	-	4,271	300	4,571
10	4,281	-	(250)	200	-	-	4,231	300	4,531
11	4,245	-	(250)	200	-	-	4,195	300	4,495
12	4,212	-	(250)	200	-	200	4,362	400	4,762
13	4,182	-	(250)	200	-	-	4,132	300	4,432
14	4,154	-	(250)	200	-	100	4,204	300	4,504
15	4,129	-	(250)	200	-	-	4,079	200	4,279
16	4,105	-	(250)	200	-	-	4,055	200	4,255
	4,083	-	(250)	200	-	-	4,033	200	4,233
18	4,062	-	(250)	200	-	-	4,012	200	4,212
	46,141		(2,750)	2,200	-	300	45,891	3,000	48,891
**19	4,023	67	(250)	200	-	-	4,040	200	4,240
20	4,004	67	(250)	200	-	-	4,021	200	4,221
21	3,985	67	(250)	200	-	-	4,002	200	4,202
22	3,968	67	(250)	200	-	-	3,985	200	4,185
23	3,951	67	(250)	200	-	-	3,968	200	4,168
	19,931	335	(1,250)	1,000	-	-	20,016	1,000	21,016

*12th ship baseline derived as follows: (used for 688-I and II)
4,000 hours - detail account estimate (rounded)
(100) hours 684 adjustment
3,900 hours
x1.08 - supervision at 8%
4,212 hours

Other Ops Baseline***	Sc Di Sk
1,365	
907	
875	
853	
836	
822	
811	
6,469	1,
1,202	
793	
785	
779	
773	
768	
762	
758	
753	
749	
746	
8,868	8
1,142	10
739	1
735	1
732	
730	1
4,078	14

***Represents 73

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688 Manhour Analysis

Other Non Engineering						Engineering					
Schedule/ Disruption/ Skill Mix	Scope	Slab	Total	Potential Growth	Potential Total Other Ops	Engineering Baseline	Schedule/ Disruption/ Skill Mix	Scope	Slab	Total	Potential Growth
985			2,350	100	2,450	400	285			685	25
268			1,175	100	1,275	160	15			175	10
200			1,075	100	1,175	150	5			155	10
172			1,025	75	1,100	150	5			155	10
124			960	75	1,035	150	-			150	10
113			935	75	1,010	150	-			150	10
99		180	1,090	50	1,140	150			40	190	10
1,961		180	8,610	575	9,185	1,310	310		40	1,660	85
303	50		1,555	100	1,655	225	10	65		300	25
87	50		930	50	980	145		5		150	10
75	50		910	50	960	145		5		150	10
71	50		900	50	950	145		5		150	10
62	50	120	1,005	50	1,055	145		5	25	175	10
57	50		875	50	925	145		5		150	10
48	50	60	920	50	970	145		5	10	160	10
42	50		850	50	900	145		5		150	10
47	50		850	50	900	145		5		150	10
46	50		845	50	895	145		5		150	10
44	50		840	50	890	145		5		150	10
882	550	180	10,480	600	11,080	1,675	10	115	35	1,835	125
108	50		1,300	50	1,350	225	10	65		300	
11	50		800	50	850	145		5		150	
10	50		795	50	845	145		5		150	
8	50		790	50	840	145		5		150	
10	50		790	50	840	145		5		150	
147	250		4,475	250	4,725	805	10	85		900	

nts 730 up a 94% curve with 400K on
lead boats for Procurement and WAC

Cost Engineering
June 27,1975

Enclosure (2)

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[illegible] OF GENERAL [illegible] CORPORATION
[illegible] CONFIDENTIAL [illegible]
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[illegible]RATION.

	Engineering							Total Division		
tential Total her Ops	Engineering Baseline	Schedule/ Disruption/ Skill Mix	Scope	Slab	Total	Potential Growth	Potential Total Engineering	Total	Potential Growth	Grand Total
2,450	400	285			685	25	710	9,386	525	9,911
,275	160	15			175	10	185	7,107	410	7,517
,175	150	5			155	10	165	6,691	410	7,101
,100	150	5			155	10	165	6,116	385	6,501
,035	150	-			150	10	160	5,788	385	6,173
,010	150	-			150	10	160	5,608	385	5,993
,140	150			40	190	10	200	6,063	560	6,623
,185	1,310	310		40	1,660	85	1,745	46,759	3,060	49,819
,655	225	10	65		300	25	325	6,172	425	6,597
980	145		5		150	10	160	5,351	360	5,711
960	145		5		150	10	160	5,291	360	5,651
950	145		5		150	10	185	5,245	360	5,605
,055	145		5	25	175	10	160	5,542	460	6,002
925	145		5		150	10	170	5,157	360	5,517
970	145		5	10	160	10	160	5,284	360	5,644
900	145		5		150	10	160	5,079	260	5,339
900	145		5		150	10	160	5,055	260	5,315
895	145		5		150	10	160	5,028	260	5,288
890	145		5		150	10	160	5,002	260	5,262
,080	1,675	10	115	35	1,835	125	1,960	58,206	3,725	61,931
,350	225	10	65		300		300	5,640	250	5,890
850	145		5		150		150	4,971	250	5,221
845	145		5		150		150	4,947	250	5,197
840	145		5		150		150	4,925	250	5,175
840	145		5		150		150	4,908	250	5,158
,725	805	10	85		900		900	25,391	1,250	26,641

Enclosure (3)

Schedule Analysis

	a	b
690 Delivery	May 1976	June 1976
Intervals	692 - 6 months 694 - 6 months Then 4 months	692 - 6 months 694 - 6 months Then 5 months for 10 ships Then 4 months
Delivery of 710	May 1982	April 1983
Slip of 710	15 months	26 months

Note:

1. Neither "a" nor "b" have any strike contingency.
2. "b" reflects what is felt to be the impact which TRIDENT will have on the overall production capability. "a" ignores TRIDENT but assumes a production rate of greater than three ships/year unlikely considering the size and complexity of the ships.

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Enclosure (4)

Rate Calculation

The rates are based on the First Quarter 1975 CTC rates of $14.11 for 688-I To Go manhours and $16.13 for 688-II To Go manhours with the following adjustments:

688-I

For alt "a"

Estimate a six month slip in the midpoint because of schedule slips and the fact that the later ships will have the majority of the added manhours. Use a 10% total rate escalation rate, since most of the shifted manhours will not cross the first year of an MTC contract.

Therefore the rate is:

$14.11 X 1.05 = $14.82

For alt "b"

Add three months more shift to the midpoint due to more schedule shift and add five points to the overhead to be consistent with the less optimistic manhours.

Therefore the rate is:

$14.82 X 1.05 = $15.56

688-II

For alt "a"

Estimate a one year average slip in the midpoint: Use a 12% annual total rate escalation rate, since most manhours will cross the first year of a MTC contract.

Therefore the rate is:

$16.13 X 1.12 = $18.07

For alt "b"

Estimate a two year average slip in the midpoint. Also add 10 points to the overhead to be consistent with the less optimistic manhours.

Therefore the rate is:

$18.07 X 1.17 = $21.14

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INTEROFFICE COMMUNICATION (39)

ROP
LJS

4/16/76

ST. LOUIS OFFICE FROM HARTFORD OFFICE

FOR TERRY LENGFELDER FROM WILLIAM J. WELDON
BRUCE M. PROUTY

DATE APRIL 12, 1976

SUBJECT: GENERAL DYNAMICS CORP. - ELECTRIC BOAT

The following items were noted during our review for the quarter ending March 31, 1976 at the Electric Boat Division.

1. The amortization of the 1975 MTC strike costs and Quonset Point start up costs for the 1st quarter 1976 are as follows:

	688	Other	Total
Start Up Costs	$190M	$362M	$552M
Strike Costs	493M	370M	863M
	$683	$732	$1415

We have previously discussed this with you and are agreed that the reserve at corporate should be reduced by $1,415M.

2. There has been no change in the reserve required for the possible liability to the unions for the overtime inequalities in prior years. We have discussed this with George Roos, Director of Industrial Relations, who indicated that further discussions have been held but no offers or counter offers have been made.

3. There was a change in the method of allocating the accounts payable accrual to contracts at the end of this quarter and the change resulted in additional sales of approximately $10.4 million and profit of $300,000. Under the prior method the costs of 10.1 million would have been included in inventory and no profit recorded. We agree that the change is appropriate.

4. The division continues to book profit on the Trident contract at 7.5% of returned costs although the indicated profit rate at completion is 11.7%. This results in a reserve of $3.6 million. However, we are not suggesting that

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INTEROFFICE COMMUNICATION

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this amount be recorded as income.

5. Profit on two contracts, the Trident Detail Design and the 585 overhaul have been overbooked by about $700,000 and this amount will be amortized over the remainder of 1976. This resulted because the profit rate at completion was changed on these contracts due to a new estimate during the quarter ending March 31, 1976. However, the profit rate was not adjusted retroactively for the costs incurred to date. This accounting is consistent with prior years and we think it is correct as currently recorded.

6. The 688 program appears to be making less progress than anticipated, however, no loss reserve is proposed at this time. You should consider additional disclosure of exposure and risk on this program and also disclosure of settlement of a portion of the REA on April 7, 1976.

As of December 31, 1975, the division was estimating a profit of approximately $40 million on the 688 program. The following summary reflects certain items which have happened since that date.

Profit projected as of December 31, 1975		$40 million
Less		
1. Settlement of REA on 688-I contract for less than anticipated amount.	$ 8	
2. Estimated overrun on material based on preliminary re-estimate.	$15	
3. 1.4 million hour estimated overrun on 688-I contract since returns for 1st quarter have not indicated the man-hours per percent progress have made substantial improvement. 1.4 million hours @ $15	21	41
Loss		(1)

Per phone call -
Est sales includes
$35 mil claim
recovery on
2nd flight.

In essence the program would be at zero profit if the 1.4 million hour overrun materializes. This would place the manhours at the level estimated by the shipyard in August, 1975.

AA&Co. 0-127
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INTEROFFICE COMMUNICATION

-3-

The REA for $199 million which was filed in February, 1975 was settled on April 7, 1976 for $97 million. The contract modification signed as a result of this settlement allows the division to file an additional claim for any items arising subsequent to May 20, 1975 on the 688-I contract and an original claim on the 688-II contract.

We believe the internal reporting on this contract continues to be inadequate since there is no measurement of actual returned hours vs the hours expected to be incurred for the actual progress achieved.

7. There has been no change in the status of the overhead ceiling agreement.

William J. Weldon
WILLIAM J. WELDON

Bruce M Prouty
BRUCE M. PROUTY

mjr

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TO SEE BELOW OFFICE FROM ST. LOUIS OFFICE

SEE BELOW TERRY L. LENGFELDER

AUGUST 2, 1976

DRAFT OF MEMO ON MEETING OF JULY 30

Enclosed is a copy of a draft memo on our meeting Friday and a return envelope. Please review this draft carefully and either telephone me with changes, or insert the changes on your copy and return it to me. If there are no suggested changes, please make a notation to that effect on the copy and return it to me.

As soon as your comments are received, I will issue the memo in its final form.

Terry Lengfelder
TERRY L. LENGFELDER

Enclosure

SS

TO: Mr. Robert O. Palmer - St. Louis
Mr. William J. Welden - Hartford
Mr. John L. Hennessey - Chicago

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TO OFFICE FROM ST. LOUIS OFFICE

MEMORANDUM FOR THE FILES TERRY L. LENGFELDER

JULY 30, 1976

GENERAL DYNAMICS CORPORATION

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Today we had a two-hour meeting with Gorden MacDonald and Art Barton of General Dynamics Corporation for the purpose of discussing with them the results of our second quarter quarterly review as it pertains to the Electric Boat Division. Barton is the chief financial officer of Electric Boat and Gorden MacDonald, a corporate executive vice president, has been spending full-time as the chief executive officer of the Electric Boat Division. Present from Arthur Andersen were Bill Weldon, Electric Boat engagement partner (Hartford), John Hennessy, advisory partner, Bob Palmer, engagement partner, and Terry Lengfelder, co-engagement partner. The meeting took place after a preliminary meeting that the four Arthur Andersen & Co. representatives had along with Len Stoecklein and Bruce Prouty in the St. Louis office so that Messrs. Weldon and Prouty could report their findings to the St. Louis office. Weldon and Prouty also had been in close contact and discussion with Messrs. MacDonald and Barton throughout the last several weeks in connection with this quarterly review.

The meeting was begun by reviewing hard copies of Bill Weldon's slide presentation (complete set attached) with Gorden MacDonald. Gorden had seen all of this material but had not seen the formal presentation assembled in this format. After these schedules were briefly reviewed at which time Bill Weldon commented that these schedules as well as Art Barton's schedules outlining the division's position on the 688 Program had been presented to Hennessy, Lengfelder and Palmer. Gorden MacDonald at some length explained the steps the division will be taking over the next couple of weeks to improve the situation at the Electric Boat Yard. Gorden also dwelled somewhat on the very favorable results the corporation has experienced during the first three weeks of July in the productivity area of Flight Number 1. MacDonald's steps to improve productivity relate mainly to organizational changes that are expected to be made. He indicated that he is returning to an organization that was in place 3-1/2 years ago prior to the time Mel Curtis transferred from Convair to the Electric Boat Division to become involved in the operation of the boatyard.

FOR DISCUSSION PURPOSES ONLY

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MEMORANDUM FOR THE FILES - 2 - JULY 30, 1976

After Gorden's comments, John Hennessy discussed our deep concern with the status of the program. He indicated that while great effort is being made by Corporate and division people, statistics indicate that the picture on this program has worsened a good deal since December 31 and pointed out that we feel the Board of Directors should in some way be informed of our deep concern with this program. Gorden MacDonald indicated that he sees our point based on slippage of the company's estimate to completion but takes the position that as far as he is concerned the program, while having slipped somewhat on paper to the point where it now indicates to him a break-even without the "cushion" of a $40,000,000 profit that was indicated and he said that the program has in fact improved since December 31, inasmuch as conditions which existed then which had not been recognized are now fully recognized and have been acted upon by management. He indicated that he sees the reasons for our concern but stressed that the changes being made in the yard will correct the deteriorating productivity situation.

Gorden indicated he plans to make a presentation on the status of the program to the Executive Committee on Wednesday of next week at which point he will express our concern and present to them the slides that Bill Weldon used in his review along with the Corporation's position on the program. Bill Weldon indicated to Gorden he felt that a point should be made to the Executive Committee that clearly states that the basis of the division's estimate is the very optimistic July results and a projection therefrom. Gorden responded by saying that this will be made known to the Executive Committee and there is no intent to mislead anyone in the company.

Gorden reiterated that he feels strongly that no loss should be recorded and he thinks the disclosure along the present lines (i.e., that additional recoveries must be made from the Navy and productivity gains must take place to ensure that the program does not incur a loss).

Gorden MacDonald and Art Barton agreed with our observation that August and September results should verify their position that the inefficiencies have peaked and productivity gains beginning in July will begin to be realized significantly. They also indicated that a detailed study will be taking place shortly on the labor estimates for the second flight of eleven submarines and that if these detailed studies and the results in August and September indicate absence of the needed (and expected) productivity improvement recognition will have to be made of a loss in the third quarter.

FOR DISCUSSION PURPOSES ONLY

FOR DISCUSSION PURPOSES ONLY

Bob Palmer then summarized his perception of the company's position being that, while there are large uncertainties in the program, General Dynamics continues to believe that it will not be a loss program. However, in view of these uncertainties will undertake a careful analysis of the early third quarter results and the estimated hours of the second flight and make appropriate decisions from an accounting standpoint based on the results of these studies.

John Hennesey indicated that we feel strongly that in some forum, either the Board of Directors, Executive Committee or Audit Committee, the Board should be informed of our concern and that it would probably be appropriate that we participate and attend the meeting at which this matter is discussed. Gorden indicated that an Executive Committee meeting is to be held on Wednesday and he will recommend to Henry Crown, the chairman of that committee, that John Hennessy attend the meeting on Wednesday, August 4 or the Board of Directors' meeting on August 5. He said he will use Bill Weldon's slides to express our deep concern. John indicated to Gorden that that arrangement would be satisfactory.

I indicated to Gorden that it had been our experience in the past that David Lewis sometimes has preferred that we meet with him prior to meeting with committees of the Board of Directors and offered to meet with Mr. Lewis prior to our taking part in the Executive Committee meeting. Gorden indicated that such a meeting with David Lewis would probably be an unproductive session and that Lewis would be in attendance at the Executive Committee meeting that Crown will chair on Wednesday.

During the course of the discussion, John Hennessy asked Gorden and Art Barton whether these major organizational changes that Gorden planned to make in the coming weeks would interfere with the favorable trend of productivity that has been experienced over the last couple of months. Both Barton and MacDonald stressed strongly that if this is a real trend that represents improved productivity there is no way that the organization changes will do anything but support that trend and cause the trend to improve even further since this momentum should not be harmed by what they feel to be a superior organization to that one presently in effect.

Bill Weldon asked how the organization change would affect Mr. Mackenzie who has been one of the more effective operatives in the Electric Boat yard over the past couple of months. Barton indicated that the change in its first phase would not affect his job and that very few responsibilities would be taken away from him when the organization change was complete so he should continue the progress he has been making.

TERRY L. LENGFELDER

SG

FORM 0121 - REV. 10 67

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MEMORANDUM FOR THE FILES WILLIAM J. WELDON

SEPTEMBER 24, 1976

GENERAL DYNAMICS CORPORATION --
ELECTRIC BOAT DIVISION -- FAR 115 MEMO

Description of Company's Business

Electric Boat is engaged almost exclusively in the design and construction of submarines for the United States Navy. These contracts fall into the following major classifications:

a. New construction
b. Overhaul and conversion
c. Engineering and prototype construction

Sales in 1976 will approximate $850 million, of which about $500 million will be for new construction. The bulk of the new construction relates to the 688 program (covering 18 submarines) with a smaller amount coming from the Trident (3 subs) contract. Approximately 10-12% of the 1976 sales volume will be from overhaul and conversion contracts, and the remainder from engineering and prototype contracts.

The new construction contracts are FPI (fixed price incentive) contracts whereby Electric Boat shares cost underruns and overruns with the Navy to specified limits. When the ceiling price on a contract has been reached, further overruns are borne entirely by Electric Boat. Construction contracts frequently spread out over a period of years and involve millions of direct labor hours (the 688 program, actually made up of two contracts, will not be completed until 1982 and will involve approximately 75-80 million direct shipyard labor hours) which makes it difficult to audit estimates of cost to complete.

Overhaul and conversion contracts generally range in the $25-to-$30 million category and are normally CPIF (cost plus incentive fee). On these contracts Electric Boat earns a fixed fee if the total costs incurred equal the original target cost. If there is an overrun or underrun, the fixed fee is adjusted based on the variance from original target cost. There is a guaranteed maximum and minimum fee included in each contract and

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DYNAMICS CORPORATION.

therefore, the downside risk is limited to excessive cost disallowances under ASPR. The Division has never incurred excessive disallowances since ASPR defines what are considered disallowed costs and the Division monitors these items closely. These contracts are normally completed in one to two years.

The engineering and prototype contracts are normally CPFF (cost plus fixed fee). The Division is reimbursed for costs incurred plus a fixed profit on the contract. Engineering contracts are normally much smaller than the overhaul contracts and are generally completed in less than one year. The Division has one large ($220 million) contract for a prototype of the Trident reactor plant, which is a CPIF contract. Because of major cost overruns on this prototype contract, the Division is realizing only a nominal profit but should not incur a loss.

Because of the poor performance of the Division on the 688 program, there have been major management changes at the Division during 1976. The general manager, Mr. Pierce, and the deputy general manager, Mr. Curtis, both resigned and Gorden MacDonald, Executive Vice President - Finance of General Dynamics, is the acting general manager. Mr. Curtis was replaced by Jim Burns in the spring of 1976, however, just recently, Mr. Burns was replaced by Hal Foley from the Electric Boat engineering department who has the title of Director of Operations and will be responsible for running the shipyard.

In addition, Mr. Hyman, the 688 program manager, has recently resigned and a replacement has not been named. The program office did not have any line responsibility and, therefore, Mr. Hyman's resignation should not have a dramatic impact on productivity of the shipyard.

There have also been other numerous middle management changes during the year in an effort to improve productivity on the 688 and Trident programs.

General Scope of Our Examination

This is a referred engagement from our St. Louis office and involves a full audit so that we may issue an interoffice report to St. Louis. The bulk of our audit work is concentrated at Groton. A significant manufacturing operation has been established at Quonset Point, Rhode Island, and we will visit that location for purposes of understanding the operation, physical inventories, and evaluation of the estimated labor hours to complete the work assigned to that location.

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In determining our overall audit approach, we will take into account the major internal control strengths and weaknesses and other factors concerning the Division which are as follows:

Strengths:

1. The Division has had a large amount of experience in both the new construction and overhaul areas and has maintained detailed records of prior experience which are used in estimating and monitoring costs on current contracts.

2. Detailed procedures manuals clearly define responsibilities for each contract area, and one individual is designated as the overall coordinator of the contract.

3. Both a divisional and corporate internal audit staff are constantly reviewing the detailed operating procedures of the Division to determine that approved procedures are being followed.

4. Detailed operating budgets are prepared annually, and actual performance is measured against this budget monthly. Detailed explanations are obtained for significant variations from budget.

5. Labor, which represents a significant portion of total cost on each contract is constantly monitored to ensure that time is charged to the correct contract.

6. Overall internal control is strong with good segregation of duties.

Weaknesses:

1. The new construction contracts are very large and cover a period of many years, and it is difficult to project costs (both as to volume and rate) into the future.

2. The total cost recoverable on the contracts is in certain instances tied to an economic index such as the Consumer Price Index, the movement of which can have a dramatic effect on the profitability of a contract.

3. The Division's shipyard is scheduled for a high percentage of occupancy over the next three to four years, and with the increased activity, it will be more difficult to monitor costs.

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BE RELEASED WITHOUT PRIOR WRITTEN NOTICE TO GENERAL
AMICS CORPORATION.

4. Procedures for monitoring physical progress on contracts are not tied into the financial records.

5. Major management changes have been made during the early part of 1976.

6. Projected productivity improvements have not been achieved.

Critical Audit Areas

Critical audit areas are as follows:

1. There are several problems related to the 688 program.

   a. Progress on the first ships of the class has been slow and there have been substantial overruns in terms of direct labor hours. The Division is not currently anticipating a profit on the program and will be making a complete reestimate to determine if a loss should be recorded.

   b. The Division will file a claim against the Navy on December 1, 1976, for approximately $300 million. Total estimated revenue to be received on this claim will have to be evaluated.

2. Volume on the Trident contract has increased significantly during 1976 and it is anticipated that profit of approximately $12-15 million will be recorded on this contract in 1976. We will review this contract to determine the estimated revenue and costs are reasonable.

3. An overhead ceiling agreement was entered into with the Navy in 1972. In 1975 the Defense Contract Audit Agency (DCAA) did a preliminary audit and claimed approximately $70 million in disallowed costs. Subsequent discussions have reduced this amount to approximately $35 million, and the Division management believes that it will be settled for $10-$15 million. The ultimate settlement of this problem may be in the courts and the status of this item will require evaluation during the audit.

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AMICS CORPORATION.

Our audit work will be concentrated primarily on the above long-term contracts, and we will make extensive use of the expertise of one of our administrative services partners, Dick Boyle, who has had substantial shipyard experience.

WILLIAM J. WELDON

JP

GENERAL DYNAMICS MEMORANDUM
Electric Boat Division

TO: Mr. G. E. MacDonald
Date July 26, 1977
42
FROM: A. M. Barton

FILE NO.:

SUBJECT: Second Quarter Results of Operations

REFERENCE:

Sales for the Second Quarter were $487 million, compared to a budget of $469 million. Net earnings were $7.9 million, slightly more than the plan of $7.7 million. This apparent good performance is the result of maintaining the SSN688 Program at a zero profit or loss and recognizing 1½% on all Trident work.

A review of our performance on a program by program basis shows that we are overrunning the targets established in the plan by substantial margins. There has been a steady deterioration in our performance since this time last year. For example, we are overrunning the target on 688-I by 64%, on 688-II by 24%, on Trident by 79%. Overruns in the overhaul area are in the range of 15 to 20%. We have exceeded the overhead rate by approximately 5 points. By comparison to all other indicators, the overhead rate we are achieving comes closest to meeting our targets. This may be attributable to the fact that we are budgeting substantially below plan and the overhead pressure that this creates is producing a beneficial result.

Our cash forecast reflects the problems being experienced in our manhour performance. As you know, we attempt to develop an accurate near term forecast by calculating cash flows based on estimated costs in excess of the plan. However, even with these corrections we are over the planned $46.3 million used, by $14.4 million, approximately 30%.

We have not developed a cost to complete for 688 ships for the Second Quarter because a review of the manhours submitted by the various departments has not been completed. Since, in several instances, we have already exceeded the estimates which form a part of the 1977 Plan, it will be necessary to complete these reviews in order that we have a credible estimate for future analyses. As a result of the performance deterioration discussed above another substantial increase in the estimated cost at completion of the SSN688 is inevitable.

A. M. Barton
A. M. Barton

04-00-0442 REV 7-73

RISK ASSESSMENT
688-I and 688-II
Manhours (000)
$(000)

Probability %	Est.	0	25	50	75
Shipyard Hours					
688-I	36,307	36,307	36,600	37,400	38,7
688-II	41,899		41,899	44,500	46,5
Support Hours	-				
688-I	10,753	10,753	11,260	11,800	12,8
688-II	10,615	10,615	11,100	12,500	13,5
Schedule		22F Mod	22F + 6	22F + 14	22F +

Probability %	0	25	50	75
688-I Manhours	36,307	36,600	37,400	38,7
	10,753	11,260	11,800	12,8
	47,060	47,860	49,200	51,5
688-II		41,899	44,500	46,4
		11,100	12,500	13,5
		52,999	57,000	59,9
Manhour Cost $	0	20,200	106,430	189,2
Schedule $		20,000	55,000	70,0
Cost Increase $		40,200	161,430	259,2
Current Est. $	2,233,119	2,233,119	2,233,119	2,233,1
Potential Cost $	2,233,119	2,273,319	2,394,549	2,492,3
Current Revenue $	1,856,333	1,856,333	1,856,333	1,856,3
Profit/Loss $	(376,786)	(416,986)	(538,216)	(635,9
Potential REA Revenue	380,766	402,000	368,000	329,0
Profit/Loss $	$ 3,980	$ (15,000)	$ (170,000)	$ (307,0

1-24-77

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GENERAL DYNAMICS MEMORANDUM
Electric Boat Division

TO: Mr. G. E. MacDonald
OM: A. M. Barton
Date July 26, 1977

(43)

FILE NO.:

SUBJECT: Second Quarter Results of Operations

REFERENCE:

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A. M. Barton
A. M. Barton

84-00-0442 REV 7-73

RISK ASSESSMENT

688-I and 688-II
Manhours (000)
$(000)

Probability %	Est.	0	25	50	75
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1-24-77

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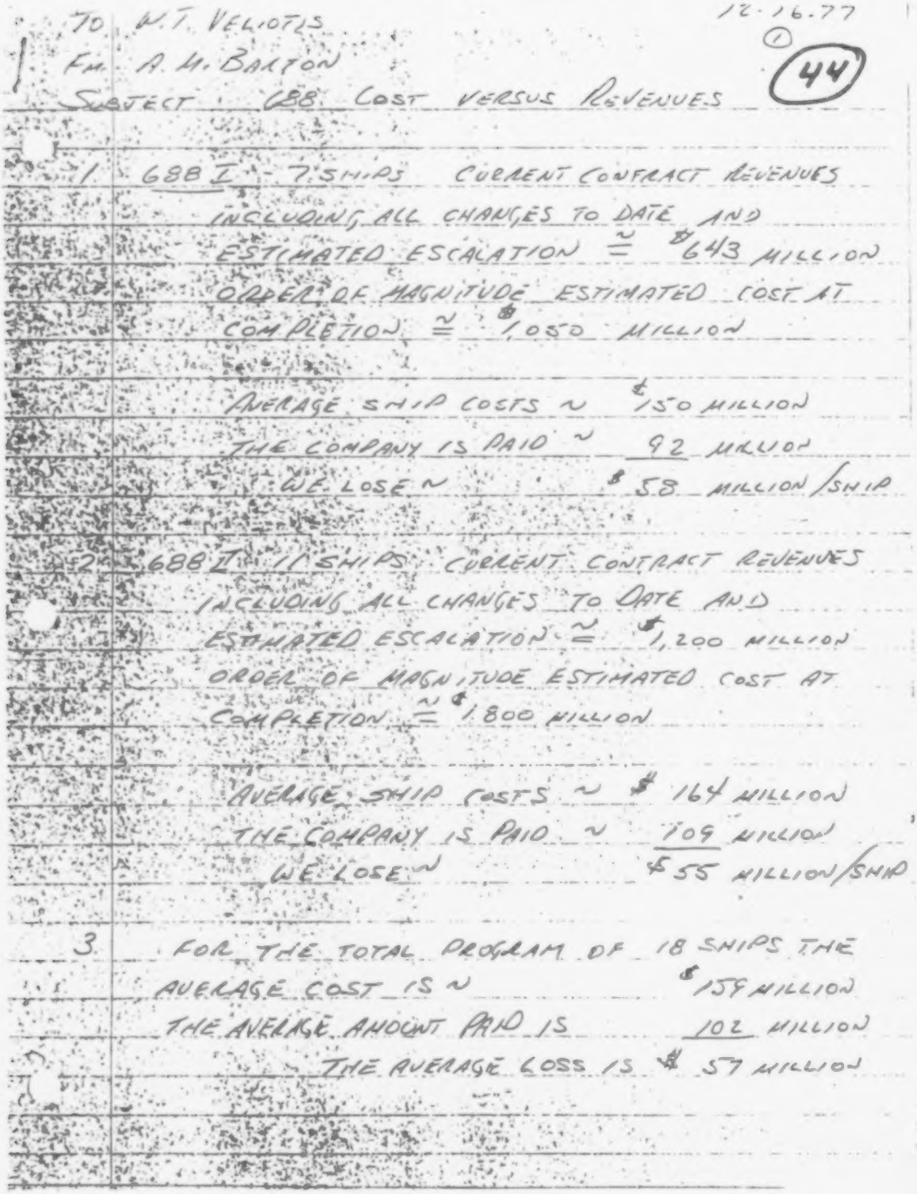

TO W.T. VELIOTIS 12-16-77
FM A. M. BARTON ① (44)
SUBJECT 688 COST VERSUS REVENUES

1 688 I - 7 SHIPS CURRENT CONTRACT REVENUES INCLUDING ALL CHANGES TO DATE AND ESTIMATED ESCALATION ≅ $643 MILLION
ORDER OF MAGNITUDE ESTIMATED COST AT COMPLETION ≅ $1,050 MILLION

AVERAGE SHIP COSTS ~ $150 MILLION
THE COMPANY IS PAID ~ 92 MILLION
WE LOSE ~ $58 MILLION/SHIP

2 688 II - 11 SHIPS CURRENT CONTRACT REVENUES INCLUDING ALL CHANGES TO DATE AND ESTIMATED ESCALATION ≅ $1,200 MILLION
ORDER OF MAGNITUDE ESTIMATED COST AT COMPLETION ≅ $1,800 MILLION

AVERAGE SHIP COSTS ~ $164 MILLION
THE COMPANY IS PAID ~ 109 MILLION
WE LOSE ~ $55 MILLION/SHIP

3 FOR THE TOTAL PROGRAM OF 18 SHIPS THE AVERAGE COST IS ~ $159 MILLION
THE AVERAGE AMOUNT PAID IS 102 MILLION
THE AVERAGE LOSS IS $57 MILLION

②
12-16-77

4. CURRENT SITUATION ON COMPLETED SHIPS

	SPENT	COLLECTED	LOSS
690	$176 MILLION	$83 MILLION	$93 MILLION
692	$131 MILLION	87 MILLION	$44 MILLION

THE REASON WE HAVE COLLECTED MORE ON 692 IS THAT MORE ESCALATION IS PAID ON EACH SUCCEEDING SHIP.

5. TOTAL PROGRAM CASH PERFORMANCE

SPENT AS OF NOV 26th 1977	$1,215. MILL.
COLLECTED	884 MILL
UNREIMBURSED	$331 MILL

45

114.131

Material Review Team - Electric Boat
19 September 1977

GENERAL DYNAMICS

Memo No. DSL-77-05
27 January 1977

114.260

To: Gorden E. MacDonald

From: D. S. Lewis

Subject: Status of Electric Boat Operations

1. It is readily apparent that aggressive action must be taken to improve personnel productivity and the housekeeping at Electric Boat if we are to expect any measureable reduction in submarine construction costs. We have added a large number of new facilities and have also added a great many new people to the Electric Boat rolls in the past few months. The records show that the total output of the yard on the 688 contract has not increased at all, even though the number of people assigned to many of the ships have been increased by 100% or more. The short visit we made to the yard on 26 January was very revealing and extremely painful. My reactions are as follows:

   (a) In the areas we visited, there are hundreds and hundreds of people who are operating completely without supervision. I doubt that most of our people really want to loaf and the majority will work if they know what to do and how to do it. In visiting some areas, some people were hard at work while others stood around in idle conversation. There was almost an air of arrogance about these "stand-around" people. They made absolutely no effort to appear busy when officers or supervisors of the division came around. They continued their conversations without embarrassment and certainly without reaction to the presence of the top people in the division. It is obvious that these people feel that their jobs are secure. The word must be out that Electric Boat badly needs people and will hire them whether there is work to be done or not. It is very obvious that the first-line supervision in Building 260 is essentially non-existent.

   (b) The condition of the brand new Building 260 is the most deplorable of any operation I have ever seen in my life. This is almost impossible to believe when you consider that the building was turned over for operations only a few months ago. The management and people of Electric Boat are treating Building 260 as just another piece of real estate in which to operate in the traditional way of Electric Boatyard workers. But, how in the world the yard management, from the first line to the operations manager, can watch this terrible situation evolve and develop without taking action is more than I will ever be able to understand. There is no question but that poor working conditions result in poor personal performance and poor operational results.

2. I am deeply concerned about the future of ElectricBoat. The warning bells are every where. We have seen our schedules slipping, our forecasted cost-to-complete increasing and we have been hit by several quality control problems almost simultaneously. We have to act and quickly! Fortunately, we do have the fundamentals of a good operation available to us. Fortunately, the building is rugged and in spite of the abuse it has not fallen down and, fortunately, our good workers probably have not been spoiled by the influx of sub-standard workers. I believe that this overall issue is so great that its correction is more important than any other thing that management at Electric Boat can do. Naturally, any of the actions required to correct the above situations will fit in perfectly with the present divisional plans. I believe some or all of the following actions should be taken, plus anything else that dynamic management can think up:

(a) Personnel - I believe it is important that steps be taken to intercept a significant number of the obviously idle and unguided personnel, find out where they belong, for whom they work and why they are not working where they are supposed to be. Where satisfactory answers cannot be obtained, those people should be immediately put on suspension or discharged. There has to be an example that the company cannot and will not tolerate the present conditions. I also believe that it will probably be necessary to cull out a large number of the new people quickly, in accordance with the trial period that applies to all new hires. While we may, in the long run, need the people and the workers that are on the rolls, we certainly do not need them yet.

I believe that all first, second and third line supervision should be called into one meeting and absolutely blasted for allowing this poor performance by their people. I recognize that many of our new first line supervisors need a lot of training, but this problem is bigger than the first line supervisors alone. Certainly, there is no way that a supervisor:worker ratio of twelve would yield the present conditions if the supervisors were doing any kind of a job at all.

I am very concerned that the top people in the operations in the yard do not recognize the terrible conditions under which they are asking their people to work.

(b) Facilities - It is obvious that additional money must be spent to relocate many of the utilities required for the construction of the submarines. We cannot continue to have cables, hoses, piping, lumber, trash, garbage and water all over the floors of our buildings. Somehow, there must be some plan or operational procedure that recognizes that each workman should have his own air line or gas line or electric cable because in some places I visited there were more cables, etc. strung out than there were workmen assigned to an area. There simply has to be some routing of cable rack arrangements set up to keep the actual number of cable, etc. that are needed kept neatly stowed with lines from the center routing being left near the place of actual use. All cable, etc. must be kept above the floor level and, very importantly, all workmen should be required to collect and stow the cables, etc. to their holding fixtures after every shift. I know the immediate reaction will be that they cannot afford the time to stow those cables and then have to un-stow them when the next shift arrives. History has shown over and over again that the net result is that can be an effective and positive way to keep the work area clean and neat for higher efficiency.

The roof must be fixed immediately. We cannot afford to have that expensive building with its expensive equipment subjected to periodic rain-caused damage or inconvenience.

I would close that truck-wide door at the west end of Building 260. I would not allow traffic through Building 260 to the outer ramp. I would force all personnel who want to go from the outer area to the inner building to go through the one personnel door, at which point they can be periodically checked.

I believe the material racks for parts storage should be cleaned up, repainted and have floors put on them. If we can't convince the fork-lift workers to take the material off those transportation pallets, we should have a warehouseman visit those scenes a couple of times daily to see that the needed parts are put on the racks and that the wood pallets are collected for return to the central transportation area. As a matter of fact, it would save an enormous amount of time if we eliminated the fork-lift wood pallet concept and have these materials distributed in a simple pick-up truck, even though a warehouseman would be required to ride along and unload the parts.

It is almost laughable to see those expensive transportation vehicles carrying one or two tiny little parts on a great big wooden pallet from one end of the yard to the other and then returning for one more little part on one more big pallet. If we are going to increase the number of inspectors as a concession to "incidental work" provisions of the current contract, perhaps the union would be agreeable to having the drivers actually put the parts on the racks themselves. Some method must be found to eliminate some of that terrible wooden staging. It is painful indeed to consider that we will be building Trident submarines for the next decade using old yellow pine, tearing it down, building it up, tearing it down and cluttering up our submarines. The present approach is completely unacceptable.

PRIVATE

114.261

GENERAL DYNAMICS

INTER-OFFICE MEMO

JCK:jh/77-345
12 December 1977

To: D. S. Lewis

From: J. C. Kane

Subject: Report on Visit to EB - 8 & 9 December 1977

1. Everett Gray and I visited EB following a request to review progress in material systems offered by Gary Grimes. We met with many of the EB personnel but spent most of our time with Ed Banning, Walter Potts and Dave Walden. Banning has the overall material responsibility including the Avenel and the Canadian Ball Valve Operation. Walter Potts has the material control function under Banning and further has a role in getting the work authorization system revamped using Dave Walden of EB and Norm Victor of EB. Walden who had been assigned to head up a material management systems team when we left is essentially filling that function today with a few people from within the division and three or four Eastern Data Center types. Walden's overall mission, however, has been considerably shortened and his primary efforts today are on setting up the bill of materials and part numbering systems for both classes of ship, the integration of this overall bill of material into a work authorization file and setting up for a physical inventory and reconciliation of the data obtained with a revised automated records system. Through Norm Victor's shop working with Walden the ships have been broken down into separate geographical packages using basic cylinder sections and drawing from the existing engineering information. A general top down engineering drawing plan is being put together so that schedules for work, the engineering plans and the material availability can be combined at the trade planner level to build the ship in a logical sequence. Production control as such has been eliminated, the personnel in that area having been reassigned to the trades as planners. The foregoing revamp of shipbuilding plans as well as the inventory control system and the plan to conduct a physical inventory are the first concrete steps taken toward correction of problem No. 1 of our study titled "Inadequate Material Systems".

2. From here on I will touch just slightly on the action being taken versus the other problems by number as reported in the material survey:

(2) Lack of consolidated base line bill of material for each class - action - engineering well under way towards completion of the 688 class bill of material expected to complete by mid-January. Trident bill of material essentially complete and in good condition.

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(3) Inconsistent Scheduling - action - by 9 January it is expected that a master schedule will be available which will be adhered to by all elements of the shipyard and will be programmed through the planning department and thence to the trade planners in the operations areas. Action has already been taken to prevent shops from working ahead of schedule or on make-work programs based on material availability.

(4) Work Authorization System not Responsive to Shipyard Needs - action - former work authorization system has been cancelled. Trade planning will do what is required in the way of establishing work authority based on master schedules. The knowledgeable people formerly in production control are now back in the operations area as planners. There was an admission on the part of several of the managers we talked to that Groton had previously fallen into the trap of departments fostering their own existence and developing their own statistics at the expense of the need to support the shipyard's operations.

(5) Division does not know how much inventory exists - action - an inventory management system is being set up with the assistance of Arthur Andersen personnel and Eastern Data Center. In this area the main DSS contact is Harry Turner who had worked with us in the planned material systems renovation and from Arthur Andersen, Dick Boyle and Bob Elmore are assisting. Boyle is a partner in the Hartford office and has served in a consultant capacity to EB for a number of years. Elmore has worked extensively with Quincy in the past. In the physical inventory planning the principal worker here in Mr. Jack Randell, an EB employee who has had previous experience both at Quincy and at EB. In former years he was a material manager at EB but in recent years has served a liaison function between Groton and Quonset Point in the operations area. The tentative planning is to conduct a wall to wall inventory at Groton, Quonset and the warehouse areas. It is planned that this inventory will include the ships under construction and the work in process in the shops. It is estimated that it will take between 10,000 and 12,000 people for at least seven straight days during which the yard will necessarily be closed to all work. A training program within industrial relations is being set up to train the inventory-taking personnel. It is planned that teams will be assigned to geographic grided areas perhaps 10 to 12 to a team split between searchers and recorders plus a knowledgeable material/operations person and a team leader. The rough data sheets will then be sample checked by Arthur Andersen for audit purposes before being compiled through key punch into the computer storage. Items that are not recognizeable to existing documentation will be placed in a "black hole" or limbo for matching by qualified personnel. This area is not yet well defined. Those items for which no descriptive information can be found will be removed to surplus or scrap. The magnitude of the inventory task is huge and will be extremely difficult to manage with accuracy. It was for this reason we tempered our survey inventory recommendation to do only what we could of physical inventory that was considered practical. If we can find an alternative to this complete inventory Everett and I will so advise Gary Grimes.

(6) Lack of Program management authority - action - Takis has in effect assumed the role of program manager. The program management function for Trident still exists. That for 688 class is probably in a limbo state. One of our intents in pushing for program management was to get a handle on program policy and changes. It is my understanding that Takis has already thrown down the gauntlet to the Navy Department on the change issue. I gather the attitude is that we are not going to permit changes in these ships unless they are "sub-safe" or mandatory and then only when we can cost them out.

(7) Ineffective change control - action - I believe the EB attitude toward changes today is markedly different and change control will be a managed affair. I learned in an aside that the prospective commanding officer conferences had been decreased in frequency and in the length of time consumed. Here again I believe that arbitrary changes requested or demanded by prospective commanding officers will fall on deaf ears.

(8) Material functions controlled by differing line functions - action - Banning is now responsible for the total material function as well as the offload areas. The material system is coming together under a single authority.

The next problem areas were listed under material control:

(a) Material staging system doesn't support work schedule - action - once the physical inventory of our materials has been taken the staging system will probably no longer exist. This area under Walter Potts will probably be revised so that completed work in process afterwards needing storage will be stored in the operations area and not sent back to staging or warehouse areas.

(b) Coded material not available although so reported - action - following physical inventory coded material will be listed as available only when it is physically there. This system is automated and will be effective once it is properly purged and controls instituted to keep the information current.

(c) The next problem was listed as 15,000 material requisitions held for material availability - action - work has been under way since we left to verify the validity of these delinquent requisitions. Further, the physical inventory and working to an established schedule as well as returning credit material to stores will drastically reduce this shortage problem.

(d) Off-load deliveries from material suppliers were not supporting the yard - action - an extensive review is being made of the workload within the yard shops and particularly at Avenel to get rid of overload conditions. In particular, Avenel has been heaped with workload it was and is physically unable to complete.

(e) Surplus material is excessive - action - the physical inventory and reconciliation of records should provide much useful material for current use. However, many of the pipe details that were manufactured ahead of schedule and in quantity may turn out to be surplus and we may not be able to salvage expensive fittings because of the extensive weld work involved. The present plan to work only to an authorized current schedule should hold down the generation of new surplus material. The plan is for the yard to work no further ahead than 90 days and to manufacture no more than two ship sets of parts ahead of need.

(f) Warehouse storage capacity insufficient - action - when surplus and obsolete material is screened out and the yard areas cleaned up I believe that the storage capacity will be enough to take care of future needs. One contributing factor to the excess of material issued was the fact that 1,200 persons were authorized to draw material on signature. This resulted in many cases of duplicate withdrawals and a lack of documentation of work that was spoiled or wasted. Presently less than 200 people have authority to sign requisitions. Further, Takis is reviewing all purchase orders over $10,000 and a very tight review is being made of all purchase requisitions and requests for capital equipment.

(g) General procurement delinquent - action - there has been a restructuring of both the personnel and the organization of the procurement department with the emphasis on service to the yard. There is also under way under the particular direction of Ed Banning a move to eliminate much of the complicated paper work structure in the procurement cycle at EB.

(h) Ordering of material in advance of need - action - this was basically an accomplished fact through the ordering of most all of the material for the 688 class bought at one time. That lesson has been learned and the remaining requirements for Trident will be well scrubbed before orders are placed.

(i) Flow of material from dock to stock too slow - action - procurement was assigned the responsibility to push material and paper through the receiving department. That system was instituted before we left. It was dropped temporarily when a reduction in force was ordered following Takis' takeover. It is now being reinstated to clear material out of receiving.

A number of problems were grouped under production control. It basically speaks to the work authorization system, the lack of priority policies, the unavailability of material, the non-availability of details from machine shop areas and an excessive amount of material in the rejection cycle - action - these problems are being attacked by the establishment of clear authorized schedules, the restructuring of the work authorization procedure, the placing of planners at the working level and the inventory and screening of material for availability.

Another group of problems talked to manufacturing and construction, rework and scrap losses, inefficient man-loading - action - through the new time card system supervisors are in control of their men. They are in daily contact with the worker and the work schedules are being revised to reflect the authorized plan. The emphasis is on securing productivity on those items needed to support the current schedule.

There are several items listed under general management including lack of teamwork, ineffective supervision, incomplete indoctrination and training, lack of pride and lack of space - action - all of these items are being worked on. The yard is being cleaned up under a 7 man team and tons of material have been removed to scrap, to warehouses and to salvage areas with the resultant visibility of roadways and spaces. Supervision and motivation are being improved by productivity meetings within the operations department and the institution of the labor time cards. Training and indoctrination of personnel is undergoing study and revamping. There is an obvious decrease in the number of personnel wandering around the yard or congregating in groups off work stations. Takis is making it a practice to not only tour the work areas of the yard but to stop people at random to inquire their name, their rate, their job assignment and the supervisor's name. If he does not get satisfactory answers to these simple questions the supervisor is called in.

Here are some generalized observations on what is going on. First the Quincy people under Takis' direction have assumed all departmental posts. Both nuclear and regular engineering are reporting to Spec Reitz from Quincy. Nuclear and regular quality control are reporting to Walter Lord of Quincy. The Security force is under Ryan from Quincy. Luther Holt has the operations tasks and is using Joe Williams in a slot comparable to that vacated by Foley. Banning has all material and has Walter Potts reporting to him in the material control and the work authorization area as well as Walt Nagle in procurement. Banning also at present is responsible for the Canadian facility and Avenel. Quonset Point under Tovar is reporting directly to Takis. Gary Grimes has facilities and finance reporting to him and has apparently taken the lead in the interface with DSS. Lou Togneri has taken over all the administrative functions at EB which heretofore were scattered among many departments. According to both Takis and Gary Grimes there has been an increase in productivity and a decrease in absenteeism. Although there has been some griping there is an indication of people in the yard telling Takis and Gary that they appreciated the fact that the yard was now under firm management. Jim Burns was slated to leave in December. He is presently working on a project for Takis dealing with Vevey on facilities and tooling at Quonset Point for mass production of cylinders and components. Burns is enthusiastic about his assignment, impressed with the efforts of Vevey so far and has at Takis' request visited the Charleston facility. What future plans there are for Burns probably remains to be seen. At any rate he appreciated the opportunity to be gainfully employed.

Foremen are being given training in how to manage people and how to manage their specific jobs. In the administrative support area now headed by Togneri (Bill Pedace is reporting to Togneri) many examples of gross inefficiency have already been turned up and Togneri has got a real handful of problems to solve. He is enthusiastic about his assignment at EB and is digging down past the layers of neglect and disinterest. They are finding storehouses of office supplies, film and materials far in excess of any needs with the result that material has been surplused through shelf life limitations. There has been little control over mail systems, communications, office equipment, travel, transportation and all the other minor items that can foul up an administrative complex. In the operations area the Quincy team is finding that the work offloaded to Avenel was done without enough planning and the material and methods sent to Avenel to manufacture were not well thought out and in many cases appeared to be the result of someone deliberately trying to find the hardest way to manufacture an item. Gary Grimes had several outstanding examples of how not to produce a machined part and indicated that these examples were not the exception.

9. The work that has gone on since 24 October is pointed toward a 9 January date when a simplified material control system will be operable. The bill of material, work authorization file and engineering plans will be tailored to build the vessels in a logical sequence. It is expected that Quonset will be building complete sections of the ship to minimize a lot of rework that has currently gone on in the Groton yard. In defense of prior Quonset work it must be understood that most of the incomplete work at Quonset was the result of Groton not supporting the operation and/or demanding the arrival of incomplete cylinders to tie in with a work schedule in the yard. My general impression was that both the Quincy people and the managers at EB were enthusiastic about getting on with a defined program and were working very hard to show a positive program on the 9 January start of new operations. Since their arrival in EB the Quincy personnel have been living at the Sheraton-Norwich and Takis has held a review of their daily success and problems every evening at or following dinner. On Thursday evening Everett and I were invited to dinner with Grimes, Raitz, Holt and Banning. It was obvious from the conversation that all four men were eager to tell us of both the problems unearthed and the work they were doing to correct them.

J. C. Kane

JCK/jjh

GENERAL DYNAMICS

INTER-OFFICE MEMO

JCK:jh/77-272
19 September 1977

To: D. S. Lewis

From: J. C. Kane

Subject: Material Review Team

1. On Friday, 16 September 1977, the team presented to G. E. MacDonald alone the major findings and recommendations of our review. Following this general presentation, Everett Gray and I spoke to Gorden on six items concerning management and organization. The entire presentation was well received. It was decided in a follow-up meeting with Gorden just after lunch that the review would be presented to concerned department heads, with Gorden present, on 27, 28 or 29 September dependent on his availability.

2. The entire report, including the organization and management section, as presented to Gorden is attached. The only copies are held by Gorden, by me and now by you. No team member or anyone else has a copy.

3. When we have an opportunity, I would like to give you an oral report on my 7 weeks' observations and interviews with many key (new and old) management personnel. I will be back in St. Louis Thursday morning and intend to be in Chicago over the weekend at the D.S.S. seminar.

J. C. Kane

JCK/jjh
att.

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MATERIAL MANAGEMENT REVIEW

PLAN

- R. D. SCIULLO - INVENTORY MATERIAL MANAGEMENT SYSTEM REPORT - OCTOBER 1974
- P. GAUTHIER - MATERIAL AVAILABILITY PROBLEMS REPORT - FEBRUARY 1976
- J. C. LYON - MATERIAL SYSTEM STUDY REPORT - APRIL 1976
- BUSINESS SYSTEMS PLAN - JANUARY 1977
- JOINT AUDIT REPORT ON PRODUCTION LOSSES USN - MARCH 1977
- GD INTERNAL AUDIT REPORTS 76-004, 76-007, 75-025 AND 76-017
  WORK AUTHORIZATION SYSTEM, STAGING SYSTEM, STEEL PLATE, QUONSET POINT RECEIVING, RECEIVING INSPECTION AND PURCHASING
- EB MANAGEMENT PRESENTATIONS - 23 DIRECTORS AND MANAGERS
- EB MANAGEMENT AND EMPLOYE INTERVIEWS
- EXAMINATION OF EB MATERIAL STORAGE, STAGING AND RECORD KEEPING
  GROTON NEW LONDON MILLS MIDWAY
  QUONSET WATERFORD
- DSS MANAGEMENT PRESENTATIONS
  M. BARLOW, J. H. MACBETH, W. EVANS
- ATTENDED STATUS MEETINGS (PROGRAM, SHIP, MANUFACTURING, BUSINESS SYSTEM PLANNING)
- PROBLEM ANALYSIS AND SOLUTIONS

9/16/77

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PROBLEM: Coded Material is Often Not Available for Detail and Assembly Manufacturing, Although Reported as Available.

CORRECTIVE ACTION: (Continued)

3. Modify Physical Inventory System to require:
   - A. All items to be inventoried at least once during specified cycle.
   - B. Rigid controls on inventory adjustments.
   - C. Improvement in time span in making adjustments to Inventory Control records.
4. Inventory Control should locate personnel in key Engineering areas for pre-release problem solving and expediting releases. Co-location within Engineering could accelerate action on materials.
5. Establish managed suspense system to process documents with incorrect numbers to reduce inventory balances immediately. Suspense items must be cleared promptly.

Prepared by: R. Jones

9/16/77

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CORPORATE MATERIAL MANAGEMENT REVIEW

ELECTRIC BOAT

16 SEPTEMBER 1977

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MATERIAL MANAGEMENT REVIEW

PERSPECTIVE

- TEAM CONCENTRATED ON PROBLEMS - DID NOT CONDUCT AN OVERALL ASSESSMENT.
- PRODUCTS, FACILITIES, CAPABILITIES, AND INGENUITY OF THE DIVISION ARE HIGHLY IMPRESSIVE.
- TRIDENT SUBMARINE IS TANGIBLE PROOF OF ELECTRIC BOAT DESIGN AND CONSTRUCTION GENIUS.
- LAND LEVEL FACILITY IS AN IMPRESSIVE "STATE OF THE ART" DEVELOPMENT.
- QUONSET POINT HAS ROOM FOR EXPANSION AND IS FULL OF ENERGETIC WORKERS.
- PERSONNEL AND SUPERVISION, AT ALL LOCATIONS, WERE HOPEFUL OF IMPROVEMENT --- AND VOLUNTEERED THEIR HELP.
- ALL-WITHOUT EXCEPTION - WERE COOPERATIVE AND GAVE FREELY OF THEIR TIME AND INFORMATION.

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MATERIAL MANAGEMENT REVIEW

SUMMARY

- MATERIAL SHORTAGES ARE IMPACTING CONSTRUCTION
  - PURCHASED
  - MANUFACTURED - GROTON, QUONSET, AVENEL
- PROBLEMS:
  - MATERIAL CONTROL PROBLEMS
  - PROCUREMENT PROBLEMS
  - PRODUCTION CONTROL IMPACTS
  - MANUFACTURING/CONSTRUCTION IMPACTS
  - PROGRAM MANAGEMENT IMPACTS
  - MATERIAL MANAGEMENT SYSTEMS
  - ORGANIZATION AND MANAGEMENT
- PRINCIPAL SOLUTIONS
  - MATERIAL MANAGEMENT SYSTEM
  - BASELINE BILL OF MATERIAL
  - INTEGRATED SCHEDULES
  - WORK AUTHORIZATION CONTROL SYSTEM
  - PHYSICAL INVENTORY
  - PROGRAM MANAGEMENT AUTHORITY
  - CHANGE CONTROL
  - ORGANIZATION AND MANAGEMENT

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS #1

PROBLEM: INADEQUATE MATERIAL SYSTEMS

EFFECT: BOTH AUTOMATED AND MANUAL SYSTEMS CURRENTLY IN USE AT EB, ARE FUNCTIONALLY ORIENTED AND CONTROLLED; PRODUCE LOTS OF PAPER WITH REDUNDANT, FRAGMENTED DATA; ARE UPDATED TO VARIOUS SCHEDULES WHICH DO NOT AGREE THROUGHOUT THE DIVISION; AND CONTAIN NUMEROUS ERRORS WHICH LEAD TO A TOTAL LACK OF CONFIDENCE IN THE USEFULNESS OF DATA.

CAUSES:

1. SHIPYARD OPERATIONS CUSTOM IS TO BUILD FROM PLANS (DRAWINGS) AND EXPEDITE MATERIAL BY SIGHT, PLACING LITTLE OR NO EMPHASIS ON THE ACCURACY OF RECORDS OTHER THAN DRAWINGS AND INSPECTION DATA.

2. AUTOMATED SYSTEMS HAVE BEEN DEVELOPED OVER THE YEARS TO ACCOMMODATE INFORMATION REQUIREMENTS OF INDIVIDUAL DEPARTMENTS OR DIRECTORATES.

3. AUTOMATED REPORTS ARE SO LARGE THAT THEIR USEFULNESS, EVEN ON AN EXCEPTION BASIS, IS DOUBTFUL AND THEIR CURRENCY AND TIMELINESS DO NOT SUPPORT CURRENT WEEK WORK PLANS.

4. MOST OF THE CURRENT AUTOMATED SYSTEMS AND ALL MANUAL SYSTEMS REVIEWED DID NOT CONTAIN ANY REAL QUALITY REVIEW OVER DATA INPUT TO THE RECORDS. DATA ERRORS WERE EVIDENT IN ALL RECORDS REVIEWED.

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PROBLEM: INADEQUATE MATERIAL SYSTEMS

CAUSES: (CONTINUED)

5. LACK OF MANAGEMENT CONSENSUS ON THE CONTENT, USE AND RESPONSIBILITY FOR THE ACCURACY AND TIMELINESS OF DATA USED IN EXISTING AUTOMATED SYSTEMS.

CORRECTIVE ACTION:

1. PURSUE THE PROPOSED NEW MATERIAL MANAGEMENT SYSTEM RECOMMENDED BY THE BUSINESS SYSTEMS PLANNING BOARD WITH REGULAR PARTICIPATION BY ALL USING DIRECTORATES IN ORDER TO ESTABLISH A CONSENSUS ON THE POLICY, PROCEDURES, MANAGEMENT DISCIPLINES AND DATA PROCESSING AND CONTROL TECHNIQUES TO BE EMPLOYED.

2. CONCURRENT WITH THE DEVELOPMENT AND IMPLEMENTATION OF THE PROPOSED NEW SYSTEM, CONTINUE THE SHORT TERM UPGRADE TASKS APPROVED BY THE BSP BOARD.

3. ESTABLISH POLICIES AND PROCEDURES WHICH WILL PLACE RESPONSIBILITY FOR THE TIMELINESS AND ACCURACY OF DIVISIONAL DATA AND REQUIRE ALL DIVISIONAL USERS TO USE COMMON DATA SOURCES OF INFORMATION.

4. CONTINUE WITH THE INSTALLATION OF THE FACTORY AUTOMATED SCHEDULE SYSTEM (FASS) THROUGHOUT QUONSET POINT AND GROTON SHOPS.

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PROBLEM: INADEQUATE MATERIAL SYSTEMS

CORRECTIVE ACTION: (CONTINUED)

5. LIMIT STATISTICAL REPORTING WHEREVER POSSIBLE AND REPLACE WITH CRITICAL ITEM EXCEPTION REPORTING IN ORDER TO HIGHLIGHT REAL DIVISIONAL PROBLEMS AND ACTION BEING TAKEN.

6. INSTITUTE TOP DOWN PLANNING AND SCHEDULING TECHNIQUES WHICH DISCIPLINE WORK PLANS AND STATUS AND GIVE "WHAT IF" VISIBILITY TO PROPOSED CHANGES.

7. PROCEED IMMEDIATELY WITH PRODUCT STRUCTURE PART NUMBERING AND UNIT OF MEASURE EFFORTS.

8. INSTITUTE PHYSICAL INVENTORY POLICY AND PROCEDURES TO SUPPORT THE PROPOSED INVENTORY CONTROL SYSTEM.

9. INSTITUTE PRODUCTION CONTROL POLICY AND PROCEDURES TO SUPPORT THE PROPOSED MATERIAL REQUIREMENT PLANNING SYSTEM.

PREPARED BY: R. J. HOLLENBACH

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS . #2

PROBLEM: LACK OF CONSOLIDATED BASELINE ENGINEERING B/M FOR EACH CLASS OF BOATS

EFFECT:

1. INABILITY TO DETERMINE AND CONTROL, FROM A COMMON DATA BASE, MATERIAL LIABILITIES AND ASSETS WITHIN ACCEPTABLE LIMITS. IF THE INVENTORY WERE PRECISELY KNOWN AND IF A SHIPSET OF MATERIAL WERE PRECISELY KNOWN - EQUIVALENT SHIPSETS OF MATERIAL WOULD BE KNOWN AS WELL AS ALL IMBALANCES.

2. INABILITY TO COMPARE ASSETS AND COMPLETIONS TO B/M TO DETERMINE REQUIREMENTS AND COST TO COMPLETE.

CAUSES: 688 SSN CLASS

- NEWPORT NEWS INCREMENTAL RELEASE OF PLANS.
- INITIAL LACK OF REQUISITE E. B. ENGINEERING IN THE MATERIAL REVIEW CYCLE.
- UNTIMELY RECOGNITION OF DIMENSIONS AND CONSEQUENCES OF THE PROBLEM.

TRIDENT AND 688 CLASS

- LACK OF PRIORITY AND DEDICATION OF RESOURCES TO DEVELOP THE ENGINEERING B/M.

CORRECTIVE ACTION.

1. ASSIGN A HIGH PRIORITY AND THE REQUISITE RESOURCES TO GENERATE AN ENGINEERING B/M AND ITS STORAGE IN A WORKING DATA BASE.

2. USE OF DATA BASE INFORMATION IN FUNCTIONAL SYSTEMS FOR DAY BY DAY PROBLEM SOLVING.

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS #3

PROBLEM: √ INCONSISTENT SCHEDULING

EFFECT: INDIVIDUAL BOAT MANAGEMENT, SHOP MANAGEMENT, SUPPORT ORGANIZATIONS AND VENDORS ARE FREQUENTLY WORKING TO SUB-LEVEL SCHEDULES WHICH DO NOT SUPPORT THE CURRENT REVISIONS OF MASTER SCHEDULES.

CAUSES:

1. FREQUENT PROGRAM RESCHEDULING
2. ORIGINAL SCHEDULES NOT BASED ON DETAILED FEED TO FEED TIME ALLOWANCES
3. SLOW RESPONSE TO CHANGED SCHEDULES WITHIN THE PAPERWORK SYSTEM
4. LACK OF CONFIDENCE ON THE PART OF EB PERSONNEL IN THEIR ABILITY TO MEET SCHEDULE REQUIREMENTS

CORRECTIVE ACTION:

1. RIGIDLY ENFORCE CONSTRUCTION AND MANUFACTURE TO CURRENT SCHEDULES.
2. STOP BUILDING AHEAD OF SCHEDULE.
3. PRODUCTION CONTROL MUST BE RESPONSIBLE FOR DETAIL BOAT CONSTRUCTION SCHEDULING AS WELL AS SHOP SCHEDULING. (NOW SPLIT BETWEEN PLANNING, OPERATIONS AND PRODUCTION CONTROL.)
4. INSTALL A DYNAMIC, NETWORK BASED SCHEDULING SYSTEM FOR BOAT CONSTRUCTION (SUCH AS THE MCAUTO MANAGEMENT SCHEDULING AND CONTROL SYSTEM (MSCS).)

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PROBLEM: INCONSISTENT SCHEDULING

CORRECTIVE
ACTION:
(CONTINUED)

5. INSTALL A MATERIAL REQUIREMENT PLANNING SYSTEM AND INTEGRATE IT TO THE NETWORK SCHEDULING SYSTEM FOR CONSTRUCTION WHICH REQUIRES:

A. DEPENDABLE TOP DOWN SCHEDULING

B. INVENTORY STATUS OF RAW MATERIAL, COMPONENTS AND WORK-IN-PROCESS

C. DISCIPLINED PRODUCT STRUCTURE

D. PART NUMBERING SYSTEM

PREPARED BY: R. J. HOLLENBACH 9/16/77

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS #4

PROBLEM: THE WORK AUTHORIZATION SYSTEM IS NOT RESPONSIVE TO SHIPYARD NEEDS FOR EXPLICIT METHODS GUIDANCE AND MATERIAL SUPPORT IN CONSTRUCTING THE SUBMARINE. PRODUCTION PROBLEMS HAVE BEEN IDENTIFIED AS ORIGINATING FROM SHORTCOMINGS WHICH HAVE DEVELOPED IN THE SYSTEM.

EFFECT:

1. THE GENERAL EFFECT HAS BEEN ONE OF DISORDER AND THE APPEARANCE OF MANY DISCONNECTS AND DISCONTINUITIES IN THE PLANNED SEQUENCE OF MANUFACTURE. THIS IS EVIDENCED BY THE FAILURE OF THE SYSTEM TO PROVIDE THE PLANNED MANPOWER, MATERIALS, PAPER AND RESOURCES TO THE RIGHT PLACE AT THE RIGHT TIME TO COMPLETE WORK TO A SCHEDULE SUPPORTING THE NEXT OPERATION.
2. SHIPYARD SELECTS PORTIONS OF THE SYSTEM TO USE AT ITS DISCRETION AND DISREGARDS REMAINDER OF PAPER.
3. SINCE PEOPLE DON'T COMMUNICATE WITH EACH OTHER WITHIN DISCIPLINES NEITHER DO THE SYSTEMS THEY INVENT TO DO THEIR PORTION OF THE TASK. REDUNDANT PAPER IN THE SHIPYARD.

CAUSES:

1. THE PAPER IS NOT RESPONSIVE IN A TIMELY MANNER TO CHANGES.
2. THE PAPER IS RARELY IF EVER ON A REAL TIME SCHEDULE BASIS WITH THE DEMANDS OF THE SHIPYARD.

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PROBLEM: The Work Authorization System is Not Responsive to Shipyard Needs for Explicit Methods Guidance and Material Support in Constructing the Submarine. Production Problems have been identified as originating from shortcomings which have developed in the System.

CAUSES: (Continued:

3. The system is too burdensome to be effectively controlled. It produces massive volumes of paper and requires hundreds of people to manage. Errors, plan revisions and multi-shipset paper calls for collection of huge volumes of material. The Division is being raped of its resources (of experienced personnel and material) without a proportionate amount of progress on the submarines.

4. The paper and the system permit the manufacture of quantities of manufactured items substantially ahead of schedule with attendant risk of obsolescence and rework.

5. The paper-writers are becoming increasingly remote from the Shipyard and a gap is developing between the dynamic demands of true trade planning and an insulated central group.

6. System is being perpetuated for its own sake. Handwritten information is sometimes an exact copy of information recorded on plan.

PROBLEM: The Work Authorization System is Not Responsive to Shipyard Needs for Explicit Methods Guidance and Material Support in Constructing the Submarine. Production Problems have been identified as originating from shortcomings which have developed in the System.

CORRECTIVE ACTION:

1. Eliminate current Work Authorization System.
2. Replace it with a System which uses the Plan (drawing).
3. Divide submarines into Section, Deck Level and System and build and process to largest installable section. Do not join sections until all work is completed. Least expensive way to build submarines is to install material when there is access to move and locate material. Organize and define the current sub-systems into meaningful shipyard work paper the way the submarine is actually built.
4. Retain best features of Pipe Detail Sketches (Bend Cards), Isometrics, Steel Nesting Sketches, Electrical Plot and Sketch, etc.

Prepared by: W. Potts 9/16/77

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS · #5

PROBLEM: THE DIVISION DOES NOT KNOW HOW MUCH INVENTORY EXISTS OR SHOULD EXIST

THE FIGURE OF $106 TO $108 MILLION OF CODED STOCK INVENTORY IS CITED BUT THE TOTAL INVENTORY, WHICH ENCOMPASSES NOT ONLY CODED BUT PLAN AND MARK MATERIAL, IS UNKNOWN. THERE ARE REASONS TO BELIEVE THAT SOME OF THE INVENTORY IS OBSOLETE DUE TO CHANGES; EXCESS DUE TO MULTIPLE ORDERING; AND SURPLUS CARRY-OVER FROM EARLIER CONSTRUCTION AND OVERHAUL PROGRAMS.

THE INVENTORY VALUE HAS BEEN ESTIMATED BETWEEN $500 MILLION AND $1 BILLION.

EFFECT:

1. THE DIVISION MAY BE MISSING THE OPPORTUNITY TO REDUCE MATERIAL COST OVERRUNS THROUGH SURPLUS AND DIVERSION ACTIONS.
2. INVENTORY MANAGEMENT DECISIONS BASED ON INACCURATE INVENTORY RECORDS.
3. EXCESSIVE AMOUNTS OF TIME CONSUMED IN CONTINUALLY CHECKING RECORDS AND SEARCHING FOR MATERIAL.
4. SHORTAGES, DUE TO THE FAILURE TO INITIATE REPLACEMENT CAUSED BY REJECTIONS, LOSSES, ETC.

PROBLEM: THE DIVISION DOES NOT KNOW HOW MUCH INVENTORY EXISTS OR SHOULD EXIST

CAUSES:

1. LACK OF PHYSICAL COUNTING OF INVENTORY ASSETS.
2. LACK OF COMPLETE INVENTORY SYSTEM.
3. LACK OF A DISCIPLINED CHANGE CONTROL SYSTEM.
4. LACK OF A COMPLETE AND UP-TO-DATE CONSOLIDATED BILL OF MATERIAL FOR 688 AND TRIDENT CLASS SHIPS.

CORRECTIVE ACTION:

1. DEVELOP A MATERIAL INVENTORY ACCOUNTABILITY SYSTEM THAT WILL RECORD AND MAINTAIN COUNT DATA RECORDED FROM PHYSICAL INVENTORIES OF ALL MATERIAL.
2. THEN, CONDUCT A "WALL-TO-WALL" PHYSICAL INVENTORY OF ALL MATERIAL ASSETS, TO THE MAXIMUM PRACTICAL EXTENT. INSURE DOLLAR AND UNIT CREDIBILITY OF ACTUALS TO RECORDS.
3. DEVELOP AND MAINTAIN A CONSOLIDATED BILL-OF-MATERIAL FOR EACH CLASS OF SHIPS.
4. DEVELOP A COMPUTER DATA SYSTEM WHICH MAINTAINS THE CONSOLIDATED BILL OF MATERIAL FOR EACH CLASS OF SHIPS AND EXTENDS THE REQUIREMENTS OF ALL THE SHIPS IN EACH CLASS (MRP). DEVELOP ANOTHER COMPUTER DATA SYSTEM WHICH MAINTAINS THE CURRENT STATUS OF ALL PHYSICAL INVENTORY. CONTINUALLY COMPARE SCHEDULED REQUIREMENTS TO INVENTORY AND PREPARE PICK LISTS FOR CURRENT REQUIRED INVENTORY, ORDER INFORMATION FOR ADDITIONAL INVENTORY AND FORECASTS OF SHORTAGES IN INVENTORY. REGULARLY, DETERMINE REQUIREMENTS AND COSTS TO COMPLETE.

PREPARED BY: E. G. BANNING/R. JONES 9/16/77

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS #6

PROBLEM: Lack of Program Management Authority

EFFECT: Responsibility for Program decisions, customer interface, and design/construction/test progress either winds up in the General Manager's lap or is split among many competing areas.

CAUSES:

1. Traditional lack of program management concept at Electric Boat.
2. Function not fully defined.
3. Authority to act and control departments not delegated or assumed.

CORRECTIVE ACTION:

1. Formulate and define Program Management Policy.
2. Delegate to the Program Managers the Authority of the General Manager for their programs less certain specific non-program oriented areas (Capital, Real Estate, Engagements).
3. Assign Program Management Representative to each ship.
4. Assign Program Manager to Chair Change Board.

Prepared by: J. C. Kane 9/16/77

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS #7

PROBLEM: Ineffective Change Control

EFFECT:

1. Schedule impact.
2. Rework and ripout.
3. Out of sequence installation.
4. Material loss.
5. Inefficient man loading.
6. Loss of contract revenue.

CAUSES:

1. Lack of definitive Change Policy.
2. Acceptance of virtually all changes regardless of classification.
3. Lack of Change Control Board.
4. Design agency/shipyard relationship.

CORRECTIVE ACTION:

1. Classify changes; i.e. mandatory, critical, improvement, producibility and nice to have.
2. Challenge all changes to eliminate all that cannot meet predetermined criter
3. Establish change implementation group to provide advice and implementation direction.
4. Establish high level formal Change Board chaired by Program Manager to appro disapprove changes.

Prepared by: R; Jones 9/16/77

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS #8

PROBLEM: MATERIAL FUNCTIONS CONTROLLED BY DIFFERING LINE FUNCTIONS (I.E. PROCUREMENT, MATERIAL CONTROL, ENGINEERING, PRODUCTION CONTROL AND PLANNING).

EFFECT:

1. MATERIAL POLICIES AND PRACTICES ARE NOT UNIFORMLY APPLIED.
2. CANNOT OBTAIN INFORMATION REGARDING INVENTORY CHARACTERISTICS, VALUE OR TRENDS.
3. CANNOT RECORD CHECK AVAILABILITY OF ALL MATERIALS.
4. MULTIPLE MATERIAL SYSTEMS IN OPERATION.

CAUSES: ORGANIZATIONAL STRUCTURE

CORRECTIVE ACTION:

1. COMBINE MATERIAL CONTROL AND PROCUREMENT INTO ONE ORGANIZATION.
2. DEVELOP COMMON MATERIAL SYSTEM TO CONTROL CODED, PLAN AND MARK, OFF-LOAD, GFE, STAGED AND MRO MATERIALS.

PREPARED BY: R. JONES 9/16/77

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MATERIAL CONTROL PROBLEMS

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: MATERIAL STAGING SYSTEM DOES NOT ADEQUATELY SUPPORT SCHEDULED WORK

EFFECT:

1. TRADE UNABLE TO FOLLOW OPTIMUM SEQUENCE OF MANUFACTURE AND/OR INSTALLATION.
2. TRADES AND PRODUCTION CONTROL START A SERIES OF "WORK-AROUND" PLANNING CAUSING DEMANDS FOR MATERIAL OUT OF SEQUENCE.
3. OBSOLESCENCE OF AND DAMAGE TO MATERIAL STAGED TOO EARLY.

CAUSES:

1. MATERIAL NOT AVAILABLE BECAUSE OF LATE IDENTIFICATION BY ENGINEERING/ DESIGN.
2. MATERIAL NOT PROCESSED THROUGH THE RECEIVING CYCLE IN REASONABLE TIME.
3. MATERIAL NOT AVAILABLE BECAUSE SHOP MANUFACTURING LATE.
4. MATERIAL IS LOST IN WAREHOUSE AND/OR STAGING BECAUSE OF INCORRECT PAPERWORK, WAREHOUSE PRACTICES, WAREHOUSE LOCATIONS, AND INEXPERIENCED PERSONNEL. PROBLEM IS AGGRAVATED BY VOLUME OF MATERIAL REQUIRING STORAGE.

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PROBLEM: MATERIAL STAGING SYSTEM DOES NOT ADEQUATELY SUPPORT SCHEDULED WORK -2-

CAUSES:
(CONTINUED)

5. MATERIAL NOT AVAILABLE BECAUSE OF CHANGE ORDER ACTIVITY.
6. SCHEDULE DELAYS IN SUBMARINE CONSTRUCTION HAS BACKED-UP MATERIAL IN STAGING AREAS THEREBY INCREASING VOLUME.

CORRECTIVE
ACTION:

1. IDENTIFY AND BLITZ ALL CRITICAL SHORTAGES.
2. REVIEW SHOP WORKLOAD STATUS AND RESTRICT MULTI-SHIP MANUFACTURE.
3. VERIFY STAGED WORK PACKAGES FOR LATEST CHANGES.
4. CORRECT STAGING FILE DATA BASE TO REFLECT CURRENT SCHEDULING, FEED TO FEED RELATIONSHIPS AND MATERIAL AVAILABILITY.

PREPARED BY: W. POTTS 9/16/77

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: CODED MATERIAL IS OFTEN NOT AVAILABLE FOR DETAIL AND ASSEMBLY MANUFACTURING, ALTHOUGH REPORTED AS AVAILABLE.

EFFECT: WORK SCHEDULED AS "AVAILABLE" MUST BE SET ASIDE AND RESCHEDULED WHEN LACK OF CODED MATERIAL IS DISCOVERED.

CAUSES:

1. CURRENT SYSTEM LOGIC ASSUMES ALL CODED MATERIAL TO BE AVAILABLE.
2. EXCESSIVE DELAYS IN ENTERING TRANSACTIONS INTO THE COMPUTER SYSTEMS. (OFTEN WEEKS AND ON OCCASIONS MONTHS.)
3. INADEQUATE PHYSICAL INVENTORY SYSTEM - MANY ERRORS IN RECORDS.
4. LATE RELEASE OF ENGINEERING.
5. ACCOUNTING HOLD UP OF INCORRECT ACCOUNT NUMBER DOCUMENTS.
6. LACK OF PROPER PRIORITY SETTING CAUSES MISALLOCATION OF CODED STOCK.

CORRECTIVE ACTION:

1. RAPIDLY WORK TOWARD ABILITY TO MECHANICALLY STAGE MATERIAL IN ORDER TO PROVIDE VISIBILITY, BY EXCEPTION, OF REQUIRED MATERIAL INCLUDING CODED STOCK.
2. AN ON LINE INPUT OF STORES DOCUMENTS (REQUISITIONS, CREDITS AND RECEIVING REPORTS) IS IMPERATIVE TO ESTABLISH VALID INVENTORY BALANCES.

PRIVATE INFORMATION

MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: 15,000 MATERIAL REQUISITIONS HELD FOR MATERIAL AVAILABILITY.

EFFECT:

1. WORK HELD UP AWAITING RECEIPT OF MATERIAL.
2. DEVELOPMENT OF WORK-AROUND PLANS.
3. OTHER WORK PERFORMED OUT OF SEQUENCE, USUALLY AT HIGHER COST.

CAUSES:

1. MATERIAL NOT RECEIVED FROM VENDOR.
2. MATERIAL NOT RECEIVED FROM AVENEL.
3. MATERIAL SENT TO WRONG DESTINATION.
4. LARGE NUMBER OF UNPROCESSED CREDITS OF RETURNED MATERIAL.
5. REQUISITIONS PREPARED TO OBSOLETE SCHEDULE.

CORRECTIVE ACTION:

1. PREPARE REQUISITIONS TO CORRECT SCHEDULE.
2. "PURGE" REQUISITIONS HELD UP (RHU) FILE TO VERIFY NEED AND AVAILABILITY.
3. PRODUCTION CONTROL INITIATE INTENSIVE FOLLOW-UP WITH PROCUREMENT/ MANUFACTURING ON VERIFIED RHU'S.
4. MATERIAL CONTROL PROMPTLY PROCESS BACKLOG OF RETURNED MATERIAL CREDITS.

PREPARED BY: R. JONES 9/16/77

GENERAL DYNAMICS
PRIVATE INFORMATION

MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: Off-load - Material Deliveries From Suppliers Not Supporting Yard Manufacturing Schedules.

EFFECT: End-product schedule delays, disruption and work-arounds.

CAUSES:

1. Late recognition by Operations and Production Control that it is necessary to off-load in order to maintain or recover schedules.
2. Production Control did not initially recognize the manufacturing limitations of the yard.
3. Operations did not understand the overload condition that was being forced upon them.
4. Engineering changes which either caused rework or resulted in stop and go actions by vendors and Avenel.
5. Lack of pre-fabricated material from Quonset Steel Preparation.
6. Production Planning paper (the WA system) is not accurate nor easily understood by a vendor.

GENERAL DYNAMICS
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PROBLEM: OFF-LOAD - MATERIAL DELIVERIES FROM SUPPLIERS NOT SUPPORTING YARD MANUFACTURING SCHEDULES.

CORRECTIVE ACTION:

1. PRODUCTION CONTROL TO BEGIN THE OFF-LOAD PROGRAM(S) BEFORE A SHOP GETS IN TROUBLE AND BEFORE SCHEDULES ARE LOST.
2. PRODUCTION CONTROL/MATERIAL CONTROL ENSURE THAT CODED MATERIAL IS AVAILABLE AND THAT PREFABRICATED MATERIALS ARE PROCESSED ON TIME TO FURNISH TO SUPPLIERS.

PREPARED BY: E. G. BANNING 9/16/77

PRIVATE INFORMATION

MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: Surplus Material is Excessive.

EFFECT:

1. Material for Second Flight 688 Class and TRIDENT Ships 3, 4 and 5 may be procured and re-manufactured without any consideration for material now located in surplus.

CAUSES:

1. Credit material received at Quonset Point is not being inspected, recorded and returned to inventory.
2. Excessive Change Orders generated by 688 Design Agent, Newport News and TRIDENT Class by Electric Boat.
3. S8G Site has returned approximately twenty-five pallets of material from the Site.
4. Duplicate withdrawal of material by trades.

CORRECTIVE ACTION:

1. Organize a team consisting of Material Control, Inspection and Transportation to review, identify and dispose of material by returning to Stores or by selling as surplus.

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GENERAL DYNAMICS
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PROBLEM: SURPLUS MATERIAL IS EXCESSIVE.

CORRECTIVE
ACTION:
(CONTINUED)

2. BLITZ MATERIAL SHORTAGES DELINQUENT TO NINETY-DAY WORK PLAN. WORK REAL SHORTAGES ONLY.

3. RESTRICT MANUFACTURE OF WORK IN ADVANCE OF NINETY DAY WORK PACKAGE TO MINIMIZE THE EFFECTS OF CHANGES.

PREPARED BY: W. POTTS

9/16/77

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM:

1. WAREHOUSE/STORAGE CAPACITY INSUFFICIENT TO ACCOMMODATE MATERIAL ORDERED
2. SYSTEM UNABLE TO COPE WITH THE VOLUME OF MATERIAL BEING RETURNED FOR RESTOCKING IN STORAGE AREAS

EFFECT:

1. EXPENSIVE MATERIAL IS PLACED IN SEVERAL OUTSIDE STORAGE AREAS WAITING (A) UNTIL IT IS REQUIRED OR (B) UNTIL THE MATERIAL CONTROL AND QUALITY CONTROL CAN SPEND THE TIME TO PASS JUDGEMENT ON ITS PEDIGREE AND FIND A STORAGE LOCATION.
2. NECESSARY IDENTIFICATIONS ARE BEING OBLITERATED.
3. MATERIAL WILL LOSE ITS PEDIGREE AND HAVE TO BE RECERTIFIED OR SOLD AS SURPLUS.

CAUSES:

1. BULK PURCHASES FOR MULTI-SHIPSET CONTRACTS WITHOUT CONSIDERATION FOR AVAILABLE STORAGE SPACE.
2. POOR SCHEDULE DISCIPLINE.
3. DESIGN CHANGES.
4. MATERIAL DISBURSEMENT SYSTEM PERMITS DUPLICATE WITHDRAWALS.
5. UNPROCESSED CREDIT MATERIAL IS NOT RECORDED IN INVENTORY BALANCES.

GENERAL DYNAMICS
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PROBLEM: Warehouse Storage Capacity Insufficient to Accommodate Material Ordered

CORRECTIVE ACTION:

1. Process all credits promptly.
2. Reorganize outside storage, inventory and locators.
3. Validate "Handwritten" requisitions for Plan and Mark and allocated coded items to a legitimate boat requirement before releasing material from inventory.
4. Institute "Charge Card" System in lieu of signature authorization for requisitions.
5. Reappraise request for consolidated warehouse and determine if current events justify resubmittal of C. A. R.

Prepared by: W. Potts

9/16/77

GENERAL DYNAMICS
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PROCUREMENT PROBLEMS

GENERAL DYNAMICS
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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: GENERAL PROCUREMENT IS DELINQUENT IN SUPPLYING MATERIAL TO SHIPYARD SCHEDULES

EFFECT: SHIP CONSTRUCTION WORK IS DELAYED AND/OR SCHEDULED WORK DISRUPTED.

CAUSES:

1. INTERNAL PROCUREMENT PROCESSES ARE SLOW AND CUMBERSOME - IMPACTED BY COMPLEX ADMINISTRATIVE REQUIREMENTS.
2. PROCUREMENT DOES NOT AGGRESSIVELY PUSH/PULL PEOPLE OUTSIDE OF THEIR DEPARTMENT WHO MAY BE CONSTRAINING PURCHASING WORK.
3. PURCHASING DOES NOT DEVOTE ENOUGH EFFORT TO EXPEDITING.
4. PURCHASING DOES NOT HAVE A GOOD TOOL TO MEASURE EITHER THE VENDOR OR THE BUYER/EXPEDITOR PERFORMANCE.
5. 4000 PURCHASE REQUISITIONS FOR CODED MATERIAL DELINQUENT TO BUYER NEGOTIATED CONTRACT DELIVERY DATES.
6. 90,000 OPEN UNDELIVERED SHOP ORDER LINE ITEMS OF PURCHASED MATERIAL - 23,000 DELINQUENT TO SCHEDULE REQUIREMENTS.
7. 7000 UNPLACED PURCHASE ORDERS AND SUPPLEMENTS; INCREASED FROM APPROXIMATELY 5200 IN JANUARY '77 (3000 OVER 4 WEEKS OLD).
8. PURCHASE REQUISITIONS DESIGNATED RHU WHEN RECEIVED IN PURCHASING, WITH AN ESTIMATED COST OF LESS THAN $2500, TAKING AS LONG AS SIX WEEKS TO PLACE.

PRIVATE INFORMATION

PROBLEM: General Procurement is Delinquent in Supplying Material to Shipyard Schedules

CAUSES: (Continued)

9. Average of 35 calendar days to place an order for coded material - span runs from five days to thirteen weeks.

CORRECTIVE ACTION:

1. Develop a hard hitting expediting group.
2. Stream-line the buying functions in order to react to RHU purchase requisitions in an expeditious fashion.
3. Develop an expediting/buyer tab run which will show performance against vendor original contract delivery dates.
4. Cause the administrative section to better support the buyer/expeditor.

Prepared by: E. G. Banning

9/16/77

GENERAL DYNAMICS
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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: ESTIMATED QUANTITIES OF MATERIAL SCHEDULED FOR DELIVERY SUBSTANTIALLY IN ADVANCE OF NEED

EFFECTS:

1. MATERIAL RECEIPT RATES SUBSTANTIALLY IN EXCESS OF MANUFACTURING WITHDRAWALS.
2. EXCESSIVE REQUIREMENTS FOR WAREHOUSE SPACE AND INCREASED MATERIAL HANDLING AND INVENTORY RELATED COSTS.
3. RISK OF CHANGE IMPACT.
4. INCREASED RISK OF OBSOLESCENCE AND MATERIAL LOSS.
5. INCREASED COSTS.

CAUSES: DIVISION DECISION TO ORDER AND ACCEPT DELIVERY OF MATERIAL IN LOT SIZES OF 7 AND 11 SHIPS.

CORRECTIVE ACTION:

1. NONE ON THE PRESENT 688 PROGRAM.
2. RE-EVALUATE TRIDENT MATERIAL NEED DATES BY BOAT.

PREPARED BY: G. MCANDREW

9/16/77

GENERAL DYNAMICS
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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: THE FLOW OF MATERIAL FROM RECEIPT TO STOCK IS TOO SLOW.

EFFECT: UNAVAILABLE PURCHASED MATERIAL IS CAUSING DELAYS IN CONSTRUCTION AND IN FEEDER SHOPS FREQUENTLY RESULTING IN WORK-AROUND PLANS AND OUT OF SEQUENCE WORK.

CAUSES:

1. MISSING PAPERWORK (MATERIAL CERTIFICATIONS, TEST RESULTS, VENDOR DRAWINGS, ETC.) SOME ITEMS HELD MORE THAN A YEAR.
2. LACK OF EFFECTIVE PRIORITY SYSTEM FOR RECEIVING INSPECTION WORK.
3. LACK OF A REPORTING SYSTEM THAT ACCURATELY REFLECTS MATERIAL LOCATION, STATUS AND RESPONSIBILITY FOR MOVEMENT.
4. LOSS OF MATERIAL MARKINGS CAUSING EXCESSIVE AMOUNT OF REINSPECTION, RECERTIFICATION OR SCRAPPING OF MATERIAL.
5. DELAYS IN DISPOSITION OF RECEIVING REJECTIONS. SOME ITEMS OPEN MORE THAN A YEAR.

PRIVATE INFORMATION

PROBLEM: THE FLOW OF MATERIAL FROM RECEIPT TO STOCK IS TOO SLOW

CORRECTIVE ACTION:

1. DO NOT REIMBURSE THE SUPPLIER UNTIL REQUIRED MATERIAL CERTIFICATIONS, TEST REPORTS OR OTHER SOFTWARE IS RECEIVED AND ACCEPTED.
2. ASSIGN A SINGLE DEPARTMENT TO ESTABLISH A PRIORITY SYSTEM THAT REFLECTS TRUE CRITICALITY FOR PURPOSES OF EXPEDITING THE MATERIAL. (PROCUREMENT HAS ACCEPTED THIS RESPONSIBILITY).
3. ADOPT BAR CODE LABELING AND SCANNING MATERIAL TRACKING CONCEPT.

PREPARED BY R. H. SPARKS 9/16/77

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GENERAL DYNAMICS
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PRODUCTION CONTROL IMPACTS

GENERAL DYNAMICS
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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: THE MANAGEMENT INFORMATION PROVIDED BY THE WORK AUTHORIZATION SYSTEM IS MISLEADING

EFFECT: PROVIDES STATISTICS WHICH DO NOT DRIVE THE SHIPYARD. PROBLEMS ARE QUANTIFIED BY UNINFORMATIVE STATISTICS RATHER THAN BY EXPLICIT DEFINITION OF STATUS ON - COMPONENTS - SYSTEMS - COMPARTMENTS - TEST FORMS - ETC.

CAUSES: STATISTICS GENERALLY EXPRESSED AT B/M LEVEL WITH

- NUMBER OF B/M STARTS VS SCHEDULE
- NUMBER OF B/M COMPLETES VS SCHEDULE
- PERCENT OF B/M'S 100% MATERIAL AVAILABLE
- PERCENT OF B/M'S SOME SIGNIFICANT % MATERIAL AVAILABLE
- PERCENTAGE ANALYSES OF SOURCE OF DELINQUENCIES

CORRECTIVE ACTION:

1. BREAK DOWN BOAT BY: SYSTEM - ZONE - COMPARTMENT OR BEST COMPREHENSIVE ENGINEERING DEFINITION CONSISTENT WITH HOW THE VESSEL IS ACTUALLY BUILT.
2. IDENTIFY PERFORMANCE PROGRESS AND MANHOURS TO DEFINABLE WORK PACKAGES WHICH HAVE A SPECIFIC EASILY MANAGED AND UNDERSTOOD WORK CONTENT.

PREPARED BY: G. MCANDREW 9/16/77

GENERAL DYNAMICS
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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: LACK OF PRIORITY POLICY BY PRODUCTION CONTROL

EFFECT:

1. POOR UTILIZATION OF MANPOWER AND MACHINES.
2. UNNECESSARY EXPENDITURE OF PREMIUM TIME.
3. PRODUCING PARTS IN ADVANCE OF NEED.
4. LIMITS VISIBILITY REQUIRED BY SHOP FOREMAN TO PLAN WORK ON DAY TO DAY BASIS.
5. IMPACTS DECISION MAKING PROCESS OF "OFF-LOADING" WORK.

CAUSES:

1. INADEQUATE SHOP LOADING.
2. LACK OF GOOD PREVENTATIVE MAINTENANCE PROGRAM.
3. "BUDDY AND BULLY" SYSTEM IMPACTS ABILITY TO PROPERLY ESTABLISH PRIORITIES.
4. ESTABLISHMENT OF PRIORITIES AND EXPEDITING OFTEN PERFORMED BY SHOP SUPERVISI RATHER THAN PRODUCTION CONTROL.

CORRECTIVE ACTION:

1. ESTABLISH A DISCIPLINED SHOP LOAD FUNCTION.
2. DO NOT ALLOW THE "BUDDY AND BULLY" SYSTEM TO OVERRIDE ESTABLISHED PRIORITIE
3. REACT PROMPTLY TO CHANGES AND STOP ORDERS.
4. ESTABLISH A DIVISION WIDE PRIORITY POLICY SIMILAR TO R. CARLSON MEMO OF 3 JUNE '77 CONCERNING TRIDENT.

PREPARED BY: L. F. TUBBS 9/16/77

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GENERAL DYNAMICS
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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: Pipe Details Not Available

EFFECT:
1. Schedule is jeopardized.
2. Work is done out of sequence or stopped.
3. Uneconomic application of manpower.
4. Added costs.

CAUSES:
1. Material not available - (Purchased or Avenel manufactured).
2. Quonset Point test stand has inadequate production capacity.
3. Detail made but cannot be located.
4. Details made out of schedule sequence.
5. Detail made to out of date plan revision.
6. Stop work - Design emerging to new revision.
7. Detail not fabricated to plan - returned for rework.
8. Low productivity.
9. Excessive rework costs - 20000 hours per month in Groton Pipe Shop.

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PROBLEM: Pipe Details Not Available

CORRECTIVE ACTION:

1. Accelerated effort underway to off-load machining of fittings.
2. Purchasing expediting present suppliers of pipe fittings and valves.
3. Make Quonset Point pipe fitting test stand adequate to the machine shop flow of critical fittings.
4. Provide more machine shop capacity in Quonset Point or off-load.
5. Conduct a complete audit of pipe details at New London Mills, Waterford and Quonset Point by personnel able to recognize and identify the parts to their current revision.
6. Production Control to extend the "pick list" time of all pipe details now staged to allow for incorporation of changes if required.
7. Establish a data link between the staging file and the most recent W. A. file, to verify consistency of revisions. Exceptions will be withdrawn by Material Control and introduced into the proper circuit for rework.
8. Greater use of computer generated "Bend Cards" - improved inspection to plan.
9. Exchange of Pipe Shop supervisory personnel for interim tours of duty between Groton and Quonset Point to engender a stronger sense of identity and mutual dependence.

Prepared by: G. McAndrew 9/16/77

GENERAL DYNAMICS
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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: Details Not Available From Quonset Machine Shop

EFFECT:

1. Work of using department thrown out of sequence or stopped.
2. Work-around plans must be developed.
3. Impact cascade due to feed to feed relationship.

CAUSES:

1. Overload condition in Quonset Machine Shop. (3500 actual earned hours vs 8000 scheduled).
2. Material not available from warehouse and feeder shops.
3. Lost material replacements not available from warehouses and feeder shops.
4. An insufficient number of Horizontal Milling machines in 6 and 8 inch size is limiting output.
5. Machine downtime due to preventative maintenance program.

CORRECTIVE ACTION:

1. Production Control take aggressive action to "Off-load" Quonset Machine Shop of approximately 4500 hours per week.
2. Industrial Engineering and Controller's office perform cost effective studies to determine the need for facility expansion at Quonset Point to handle the increase in work load.
3. Production Control coordinate with responsible departments to insure prompt acquisition of required Horizontal Milling machines.

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: EXCESSIVE AMOUNT OF MATERIAL IN REJECTION/ACCEPTANCE CYCLE

EFFECT:

1. MATERIAL UNAVAILABLE FOR NEXT OPERATION.
2. DIVERSIONS OF MATERIAL FROM LATER SHIP TO SUPPORT SCHEDULE.

CAUSES:

1. AS OF 9/3/77, 4,139 PIECES OF REJECTION PAPER (CFE'S) REPRESENTING AN UNDETERMINED AMOUNT OF WITHHELD MATERIAL, HAVE NOT BEEN CLEARED.
2. SLOW DISPOSITION OR LATE REACTION TO REWORK, REORDER, ETC., AFTER DISPOSITION.

CORRECTIVE ACTION:

1. PRODUCTION CONTROL EXPEDITE THE ENTIRE REJECT TO ACCEPT CYCLE. PROPER PRIORITIES NEED TO BE ASSIGNED AND FOLLOWED TO SHARPLY REDUCE THE AMOUNT OF MATERIAL WITHHELD FROM THE NORMAL PRODUCTION FLOW.

PREPARED BY: R. H. SPARKS 9/16/77

GENERAL DYNAMICS
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MANUFACTURING/CONSTRUCTION IMPACTS

GENERAL DYNAMICS
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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: Rework and Scrap Material Losses

EFFECT:

1. Impact on Shop schedule due to unavailable material.
2. Projected loss of approximately $2M in material for the year.
3. Projected expenditure in excess of 320,000 manhours of unproductive labor in the Machine Shop and Pipe Shop, Groton during 1977.
4. Undetermined compounded costs due to impact on subsequent work operations.

CAUSES:

1. Workmanship errors.
2. Incorrect instructions.
3. Non funded changes.

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PROBLEM: REWORK AND SCRAP MATERIAL LOSSES

CORRECTIVE
ACTION:

1. MONITOR INDIVIDUAL EMPLOYES PERFORMANCE ON A DAILY BASIS TO DETERMINE NEED FOR ADDITIONAL TRAINING AND TAKE SUCH ACTION AS NECESSARY TO IMPROVE PRODUCTIVITY.
2. STRENGTHEN THE FIRST LINE SUPERVISORS EFFECTIVENESS BY LOCATING THE SUPERVISOR IN THE SAME AREA AS THOSE EMPLOYES REPORTING TO THAT PERSON.
3. PROVIDE A MANDATORY CONCENTRATED PROGRAM TO IMPROVE THE FIRST LINE SUPERVISORS BASIC SKILLS, PARTICULARLY THOSE DIRECTLY RELATED TO EMPLOYE MOTIVATION AND DISCIPLINE.
4. ENSURE THAT THE WORK PACKAGE FURNISHED THE TRADES CONTAIN ONLY THAT INFORMATION NEEDED TO ACCOMPLISH THE ASSIGNED TASK.

PREPARED BY: R. H. SPARKS 9/16/77

GENERAL DYNAMICS
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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: INEFFICIENT MAN-LOADING

EFFECT:

1. BUILDING OR MANUFACTURING AHEAD OF SCHEDULE BUT INCOMPLETE.
2. NOT MAKING SCHEDULE TO PLAN.
3. ADDING TO MATERIAL LOCATION AND CONFIGURATION PROBLEMS.

CAUSES:

1. NOT WORKING TO THE CURRENT, AUTHORIZED PLAN/SCHEDULE.
2. DELAYS IN PRODUCING REVISED PLANS/SCHEDULES.
3. LACK OF MATERIAL TO SCHEDULE.
4. AVAILABILITY OF MATERIAL BEYOND SCHEDULE.
5. NOT EFFECTIVELY BALANCING MANPOWER NEEDS TO ALL CONTROLLING FACTORS OF SPACE, FACILITIES, TOOLING, PAPER, AND MATERIAL.

PRIVATE INFORMATION

PROBLEM: Inefficient Man-loading

CORRECTIVE
ACTION:

1. Work to current schedule in Groups and Bills of Material.

2. Concentrate on securing desired productivity versus adding more bodies.

3. Streamline plan revision and Work Authorization changes to stay on intended time schedules.

4. Insist on material available to schedule and complete.

5. Fit numbers of personnel to job task for maximum effectiveness - over-manning can be self-defeating.

Prepared by: J. C. Kane 9/16/77

GENERAL DYNAMICS
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PROGRAM MANAGEMENT IMPACTS

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: LACK OF PROGRAM PROBLEM VISIBILITY

EFFECT: NO COORDINATED EFFORT TO RESOLVE SPECIFIC PROBLEMS.

CAUSES:

1. NO SINGLE AGENCY RESPONSIBLE FOR IDENTIFICATION OF ALL IMPACT PROBLEMS OR EXERCISING CONTROL OVER ALL DEPARTMENTS REACTION TO SPECIFIC PROBLEMS.
2. NO PHYSICAL LOCATION ASSIGNED TO DISPLAY PROBLEMS AND TRACK PROGRESS OF RESOLUTION.

CORRECTIVE ACTION:

1. PROGRAM OFFICE SHOULD IDENTIFY EACH SIGNIFICANT PROBLEM AFFECTING ITS PROGRAM, ASSIGN A PERSON RESPONSIBLE FOR ACTION AND TRACK PROGRESS TO SUCCESSFUL CONCLUSION.
2. CREATE SIMPLE CHARTS AND LISTINGS FOR DISPLAY THAT, AS A MINIMUM, HIGHLIGHTS EACH PROBLEM, THE PERSONS NAME WHO HAS PRIME RESPONSIBILITY FOR RESOLUTION AND THE DATE FOR COMPLETION.
3. ESTABLISH A "COMMAND" ROOM, WHERE THESE PROGRESS CHARTS ARE PROMINENTLY DISPLAYED AND WHERE PROGRAM REVIEWS ARE HELD. THIS "PROBLEM VS PEOPLE" IDENTIFICATION PROGRAM SERVES AS A POWERFUL MOTIVATIONAL FACTOR AS WELL AS AN EFFECTIVE TOOL FOR FORCING ACTION.

PREPARED BY: R. H. SPARKS 9/16/77

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ORGANIZATION AND MANAGEMENT

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: LACK OF TEAMWORK AT MANAGEMENT LEVELS (GROTON)

EFFECT: SPECIFIC PROBLEM DEFINITION AND SOLUTION LOST IN THE EFFORTS TO GENERALIZE THE SITUATION OR SHIFT RESPONSIBILITY TO THE "OTHER GUY". (QUONSET POINT AND AVENEL TREATED AS "OTHER GUY".)

CAUSES:

1. ERRONEOUS OR LATE STATUS INFORMATION.
2. FEAR OF BEING FOUND WANTING (JOB SECURITY)
3. ATTITUDE POLARIZATION AND LACK OF CENTRAL OBJECTIVE

CORRECTIVE ACTION:

1. REBUILD TEAM SPIRIT.
2. ASSUMPTION BY ALL OF A COMMON GOAL AND A WILLINGNESS TO ASSIST THE OTHER WITH "HIS" PROBLEMS.
3. INSTITUTE SATURDAY MORNING PROGRESS REVIEWS WITH DEFINED RESPONSIBILITIES AND FOLLOW-UP REQUIRED.
4. INSTITUTE SOME FORM OF OFF-DUTY SOCIAL INTERCOURSE TO ENCOURAGE BETTER COMMUNICATIONS BETWEEN KEY PERSONNEL.

PREPARED BY: J. C. KANE 9/16/77

GENERAL DYNAMICS
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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: INEFFECTIVE SUPERVISION AND MOTIVATION (GROTON)

EFFECT: EXCESS MANPOWER AS INDICATED BY THE LOW PRODUCTIVITY FACTORS AND THE LARGE NUMBERS OF APPARENTLY IDLE PERSONNEL IN THE YARDS AND IN THE OFFICES.

CAUSES:

1. LACK OF LEADERSHIP AND DISCIPLINE.
2. INADEQUATE KNOWLEDGE OF THE JOB BY THE INDIVIDUAL WORKER'S SUPERVISOR.
3. PHYSICAL SEPARATION OF SUPERVISOR AND WORKERS.
4. LACK OF MOTIVATIONAL TRAINING OR INDOCTRINATION FOR MANY INCOMING WORKERS AND FOR OTHERS WHO DO NOT GET A CHANCE TO SEE BEYOND THE IMMEDIATE TASK.

CORRECTIVE ACTION:

1. INSURE THAT SUPERVISORS HAVE TIME AND OPPORTUNITY TO SUPERVISE.
2. ZONE THE BOATS (AND PERHAPS YARD AREAS) INTO MANAGEABLE SECTIONS FOR SUPERVISORY RESPONSIBILITY.
3. STOP PRACTICE OF CALLING THE YARD "JUNGLE" OR "ZOO" - IN JEST OR OTHERWISE.

PREPARED BY: J. C. KANE 9/16/77

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MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: INCOMPLETE INDOCTRINATION AND TRAINING (GROTON)

EFFECT: SKILL LEVELS NOT ADEQUATE FOR COMPLEXITY OF THE JOB - INCENTIVE TO DO A GOOD JOB NOT EVIDENT. POOR WORKMANSHIP AND POOR SUPERVISION.

CAUSES:

1. MOTIVATIONAL TRAINING DEVELOPED FOR UNSKILLED NEW HIRES NOT APPLIED TO TOTAL INCOMING WORK FORCE.
2. NO LITERACY REQUIREMENT FOR EMPLOYMENT YET WORK SYSTEM IS BASED ON PLANS AND WORK AUTHORIZATION PAPER.
3. NO APPARENT ON-GOING INDOCTRINATION IN WORK VALUES FOR LABOR FORCE.

CORRECTIVE ACTION:

1. APPLY SOME TRAINING MEASURES (BEYOND WORK RULES AND COMPANY REGULATIONS) TO THE SKILLED OR EXPERIENCED NEW HIRES.
2. APPEAL TO BLUE-COLLAR SENSE OF PATRIOTISM WITH INDOCTRINATION IN E. B. HISTORY, SUBMARINE OPERATION AND VALUE TO NATIONAL DEFENSE.
3. CHECK TO SEE IF LITERACY LEVEL IS SUFFICIENTLY HIGH FOR WORK AND PROCESS PAPER IN THE YARD AND OFFICES.
4. ON-GOING INDOCTRINATION SHOULD BE MADE AVAILABLE TO SUPERVISION AND OFFICE EMPLOYES TO INSTILL PRIDE OF WORKMANSHIP AND SENSE OF ACCOMPLISHMENT.

PREPARED BY: J, C. KANE 9/16/77

PRIVATE INFORMATION

MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: Lack of Pride (Groton)

EFFECT:

1. Bad work habits
2. Poor housekeeping
3. Low productivity
4. Errors, rejection, losses
5. Schedule and Cost impacts
6. Absenteeism

CAUSES:

1. Lack of motivational training
2. Lack of adequate work facilities, work areas and equipment
3. Lack of leadership and discipline

GENERAL DYNAMICS
PRIVATE INFORMATION

PROBLEM: Lack of Pride (Groton) -2-

CORRECTIVE
ACTION: The following are directed primarily to #2 above:

1. Provide a cleaner work environment by removing accumulated trash, surplus material and equipment lying around.
2. Provide trash and litter receptacles adequate to the needs.
3. After removing unused or badly used storage buildings and shacks plan for motorized sweeper to keep roadways and walkways clean.
4. Clean and paint buildings as well as signs and locator information to help provide an incentive to keep areas clean.
5. Upgrade personnel sanitary facilities - once cleaned up, police if necessary to maintain order and cleanliness.
6. Provide personal equipment and clothing for dirty work areas - (coveralls and gloves for grinders/welders for example).
7. Consider renovation of administrative spaces for better efficiency.

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GENERAL DYNAMICS
PRIVATE INFORMATION

MATERIAL MANAGEMENT REVIEW

PROBLEM ANALYSIS

PROBLEM: LACK OF SPACE FOR PERSONNEL, EQUIPMENT AND MATERIAL (GROTON)

EFFECT:

1. DIFFICULT TO ORGANIZE WORK IN ORDERLY FLOW.
2. CROWDED OFFICES CONTRIBUTE TO SLOPPY OR MISSING PAPERWORK.
3. LITTLE STORAGE SPACE FOR PHYSICALLY STAGED MATERIAL FOR INSTALLATION OR FEEDER STORAGE FOR MANUFACTURE.
4. SEPARATION OF SUPERVISION FROM WORKERS.

CAUSES:

1. NO REAL ESTATE LEFT FOR EXPANSION.
2. MANY BUILDINGS IMPOSSIBLE TO RENOVATE FOR MORE EFFICIENT USE.
3. RETENTION OF MANUFACTURING OPERATIONS NOT UNIQUELY DEPENDENT UPON ELECTRIC BOAT SKILLS OR EQUIPMENT.

GENERAL DYNAMICS
PRIVATE INFORMATION

PROBLEM: LACK OF SPACE FOR PERSONNEL, EQUIPMENT AND MATERIAL (GROTON) -2-

CORRECTIVE
ACTION:

1. ELIMINATE THOSE MANUFACTURING AND SUB-ASSEMBLY OPERATIONS WHICH CAN BE PERFORMED ELSEWHERE.

2. RENOVATE VACATED AREAS FOR ESSENTIAL PERSONNEL OR MATERIAL NEEDS.

3. SPECIFIC CANDIDATES FOR CHANGE ARE:

   A) RETAIN A NON-FERROUS FOUNDRY CAPABILITY BUT MOVE THE FACILITY (WITH UPGRADE) TO QUONSET POINT.

   B) REDUCE MACHINE SHOP TO LEVEL CONSISTENT WITH EMERGENCY MANUFACTURE, REPAIR AND SHIP SUPPORT MACHINING. SUBCONTRACT TO MAXIMUM EXTENT POSSIBLE.

   C) REVIEW NEED FOR PIPE-BENDING EQUIPMENT IN WET DOCK PIPE SHOP AND FREE UP ADDITIONAL SPACE.

   D) REMOVAL OF INACTIVE MOCK-UPS TO OFF-SITE FACILITY.

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